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ABSTRACT

Supplement 7 to the Safety Evaluation Report for Louisiana Power & Light's application for a license to operate Waterford Steam Electric Station, Unit 3 (Docket No. 50-382), located in St. Charles Parish, Louisiana, has been jointly prepared by the Office of Nuclear Reactor Regulation and the Region IV Office of the U.S. Nuclear Regulatory Commission. This supplement provides the results to date of the staff's evaluation of approximately 350 allegations and concerns of poor construction practices at the Waterford 3 facility.

CONTENTS

ACRONYMS AND ABBREVIATIONS

AB -- American Bridge Company
ANI -- authorized nuclear inspector
ANSI -- American National Standards Institute
ASME -- American Society of Mechanical Engineers
ASP -- administrative site procedures (EBASCO)
ASTM -- American Society of Testing Materials
AWS -- American Welding Society

B&B -- B&B Insulation Incorporated
BM -- bill of material
BOP -- balance of plant

CAR -- corrective action report
CAT -- construction appraisal team
CB&I -- Chicago Bridge & Iron
CE -- Combustion Engineering
CIWA -- condition identification work authorization
CMI -- care and maintenance instruction (EBASCO)
CMRT -- certified material test report
C of C -- certificate of compliance
C of E -- certification of equipment
CP -- construction (site) procedures (EBASCO)
CR -- conditional release
CVN -- Charpy V notch
CVN -- construction verification notification
CY -- calendar year

DBA -- design basis accident
DCIR -- daily Cadweld inspection report
DCN -- design change notice
DN -- discrepancy notice
DR -- deficiency report
DWG -- drawing

EBASCO -- EBASCO Services Incorporated
ECCS -- emergency core cooling system
EDCN -- engineering drawing change notice
EDN -- engineering discrepancy notice
EIR -- engineering information request
Erico -- Erico Products Incorporated
ESSE -- EBASCO Site Support Engineering

F&M -- Fischbach & Moore
FCR -- field change request
FHB -- fuel handling building
FSAR -- final safety analysis report
FW -- field weld

GEO -- GEO Testing Laboratory
GMAW -- gas metal arc weld
GTAW -- gas tungsten arc weld

HAZ -- heat-affected zone
HVAC -- heating, ventilation, and air conditioning

I&C -- instrumentation and control
IE -- Office of Inspection and Enforcement (NRC)
IP -- inspection procedure (EBASCO)
IR -- information request
IR -- inspection report
ISO -- International Standardization Organization
ISO/DWG -- isometric drawing

J. A. Jones -- J. A. Jones Construction Company

LOU -- Letter of Understanding (EBASCO)
LP&L -- Louisiana Power & Light Company

M&TE -- measuring and test equipment
MCP -- Mercury Company Procedure
Mercury -- Mercury Construction Company
MRR -- material receiving inspection report
MSS -- Middle South Services

NCR -- nonconformance report
NDE -- nondestructive examination
NISCO -- Nuclear Inspection Services Company
NOV -- notice of violation
NPIS -- nuclear plant island structure
NRC -- U.S. Nuclear Regulatory Commission
NSSS -- nuclear steam supply system

OCR -- operational control record
OJT -- on-the-job training

PAB -- preliminary as-built
PCS -- process control sheet
PQAM -- project quality assurance manager
PRD -- potentially reportable deficiency
PSAR -- preliminary safety analysis report
PT -- penetrant test (report)
PVN -- PVN Steels, Inc.
PWHT -- post-weld heat treatment

QA -- quality assurance
QAI -- quality assurance instruction (EBASCO)
QAIRG -- Quality Assurance Installation Review Group
QAM -- quality assurance manual
QC -- quality control
QCIP -- quality control inspection procedure (EBASCO)
QV -- quality verification

RAB -- reactor auxiliary building
RC -- reactor coolant
RCB -- reactor containment building
RFI -- request for information
ROS -- requisition on stores
ROW -- requisition on warehouse/request from warehouse

SCD -- significant construction deficiency
SES -- steam electric station
SITP -- site inspection and test procedure
Sline -- Sline Industrial Painters Incorporated
SMAW -- submerged metal arc weld
SER -- safety evaluation report
SSER -- supplementary safety evaluation report
SUS -- startup system
SWO -- stop work order

T-B -- Tompkins-Beckwith
10 CFR 50 -- Title 10, Code of Federal Regulations, Part 50

UT -- ultrasonic testing

VQAR -- vendor quality assurance representative

WP -- welding procedure (EBASCO)
WP -- work procedure (J. A. Jones)
WPQR -- weld procedure qualification record
WPS -- welding procedure specification
WQC -- Waterford quality control procedure (EBASCO)
WSES -- Waterford Steam Electric Station
WSG -- Waterford Startup Group

1. INTRODUCTION

On July 9, 1981, the U.S. Nuclear Regulatory Commission (NRC) issued a Safety Evaluation Report (SER) (NUREG-0787) related to the proposed operation of Waterford Steam Electric Station, Unit No. 3. Subsequently, six Supplemental Safety Evaluation Reports (SSERs) have been issued by the staff. This is SSER 7.

This supplement provides, as Appendix J, the results to date of the staff's evaluation of approximately 350 allegations and concerns of poor construction practices at the Waterford facility.

Attachment No. 1 to this Appendix is a memorandum from the NRC Executive Director for Operations to the Director, NRC Division of Licensing, establishing a system for completion of outstanding regulatory actions on the Comanche Peak and Waterford nuclear power plants. Attachment No. 2 is an evaluation of the effect of specification violations during concrete construction on the structural integrity and safety of the facility's common foundation basemat. Attachment No. 3 is the staff's answer to joint intervenors' motion to reopen Contention 22 discussing the Waterford basemat's adequacy in light of the cracks discovered on the mat's surface. Attachment No. 4 is the Waterford Open Items Management Program developed to provide a systematic assessment and resolution of all the remaining licensing issues prior to the staff making its licensing decision. Attachment No. 5 is a letter dated June 13, 1984, from D. G. Eisenhut to J. M. Cain, President of Louisiana Power and Light, resulting from the staff's evaluation of allegations, identifying potential safety concerns and requesting additional information needed prior to the staff making its licensing decision. Finally, Attachment 6 is Inspection Report 50-382/84-34 documenting the findings of an inspection conducted by the Office of Inspection and Enforcement at the time the staff was on site evaluating the allegations.

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Copies of this supplement and a listing of documentation reviewed by the Task Force in evaluating these allegations are available for public inspection at the Commission's Public Document Room at 1717 H Street, N. W., Washington, D.C. 20555, and the Earl K. Long Library, University of New Orleans, Lake Front Drive, New Orleans, Louisiana 70148. Availability of all material cited is described on the inside front cover of this report.

2. THE NRC WATERFORD 3 TASK FORCE

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J. Carson	Region IV
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CONTENTS

APPENDIX J

1. INTRODUCTION

As construction activities at the Waterford Steam Electric Station, Unit No. 3, were nearing completion, the NRC's Executive Director for Operations (EDO) acted to assure that those items needing resolution prior to consideration of the operating license were promptly addressed. Because the remaining issues were quite complex, spanned more than one NRC office, and were resource intensive, the EDO issued a directive on March 12, 1984, centralizing responsibility for management of those issues. (See Attachment 1.)

The principal areas needing resolution before a licensing decision could be reached included: (1) completion and documentation of the review of the Final Safety Analysis Report (FSAR); (2) response to the motion before the NRC Atomic Safety and Licensing Appeal Board to reopen the hearing because of cracks in the concrete basemat; (3) completion of NRC regional inspection actions; and (4) resolution of allegations.

In the staff's review of the Waterford 3 FSAR, a Safety Evaluation Report (SER) and six supplements have been published. The seven safety issues remaining that have not yet been resolved will be addressed in SER Supplement No. 8, which will be issued prior to the staff making its licensing decision. These issues are: (1) environmental qualification; (2) auxiliary pressurizer spray system; (3) operating procedures; (4) leakage reduction program; (5) fire protection; (6) liquid and solid radwaste system; and (7) initial test program.

The second item that needed resolution prior to a licensing decision concerned cracks discovered in the surface of the common foundation basemat supporting the safety class structures at Waterford. A motion to reopen the hearings concerning the cracked basemat was filed with the NRC Atomic Safety and Licensing Appeal Board on December 12, 1983. In order to respond to the motion, two groups of NRC and consultant experts reexamined the basemat for both design adequacy and construction acceptability. The first group examined basemat construction records and addressed allegations of poor construction practices, including construction sequence, and concrete placement. (See Attachment No. 2 dated May 21, 1984.) The other group reviewed the original design of the basemat and its adequacy in light of the cracks discovered on the basemat surface. (See Attachment No. 3 dated August 7, 1984.) Based on these documents, the staff concluded that the common foundation basemat at Waterford is adequate to perform its intended safety functions.

Completion of routine NRC Regional inspection actions was the third area that needed to be finished before a licensing decision could be reached. Because of the enhanced effort required of the NRC Regional staff to review allegations, and the relatively small size of the Regional staff, additional resources were needed to complete the inspection program at Waterford 3. These resources were provided by various NRC Offices and consultants to assure timely completion of all planned and special inspections, as well as any required inspection followups.

The final issue requiring resolution prior to a licensing decision involves allegations concerning construction practices. During January, February, and March 1984 the Office of Investigations debriefed individuals who alleged matters of wrongdoing and raised technical issues. These individuals were very knowledgeable and were able to be very specific in many instances. By late March 1984, the staff had identified approximately 350 technical allegations. During the initial NRC staff review, allegations were sorted and categorized by subject. Initially, some allegations were too vague or too general to be adequately addressed. In a number of those cases, the issue was discussed with and clarified by the alleger. Similar or duplicate allegations were combined. For allegations related to a common subject, a single response is given.

The allegations were divided into the following general areas:

- o Piping and Mechanical
- o Civil and Structural
- o Instrumentation and Control
- o Quality Assurance and Quality Control

2. WATERFORD 3 OPEN ITEMS MANAGEMENT PROGRAM

To provide a systematic assessment and resolution of all remaining licensing issues related to the Waterford facility prior to the staff making its licensing decision, the staff developed the Waterford 3 Open Items Management Program (see Attachment No. 4). The program included resolution of all allegations identified to date pertaining to the design, construction, and operation of safety-related structures, systems, and components at Waterford.

The Management Program included the following elements:

- o Identification of all Waterford 3 open items, including allegations.

- o Definition and implementation of an action plan for each open item, including individual allegations or groups of allegations. This action plan included such items as the technical approach to resolution; the identification of review responsibilities; the schedule for completion; and an initial assessment of the potential safety significance, generic implications, and any indications of management breakdowns.

- o NRC staff conferences, when possible, with allegers to assure an accurate initial understanding of allegations.

- o Continuing staff contact with all allegers, when possible, to further assure that the staff's evaluations and resolutions accurately addressed the concerns of the allegers; as well as give the staff the assurance that all issues of safety significance were covered in their review.

The Waterford 3 Open Items Management Staff is an integrated group of management and technical specialists from various NRC offices.

The Management staff was assisted by the NRC Office of Investigations (OI). OI has had several investigations underway regarding allegations of wrongdoing, such as intimidation, forgery, and falsification. Technical issues identified by OI were provided to the Management staff for assessment. Likewise, any

items of potential wrongdoing identified by the technical staff during this review were provided to OI. In this way OI and the Management staff worked closely to resolve the issues for investigation. During their evaluation of technical allegations, the staff often met with allegers to clarify an allegation or discuss its status. In many cases, the alleger was satisfied with the staff's evaluation. Some allegers have expressly requested confidentiality and those requests have been honored. The NRC does not routinely disclose the identity of such persons providing allegations to the NRC as a matter of agency policy.

The Office of Investigations does not expect to complete its effort concerning wrongdoing activities at Waterford for several months, at which time they will issue a report of their findings. OI has, at this time however, nearly completed its field investigations and there does not appear to be any technical issues beyond those 350 already identified by the staff.

2.1 Waterford 3 Task Force

To achieve the objectives of the Program, a Waterford 3 Task Force was organized that was composed of about 40 technical specialists from NRC Headquarters and Regional Offices, and included several NRC consultants.

The Task Force was divided into teams that looked into the areas of: (1) the civil and structural (Section 2.1.1) and mechanical and piping (Section 2.1.2) disciplines; (2) instrumentation and control (Section 2.1.3); and (3) quality assurance and quality control (Section 2.1.4).

A fourth group, the Inquiry Team, was included in the Task Force. The Inquiry Team had previously investigated concerns raised in May 1983 about LP&L's Quality Assurance (QA) Program. The Inquiry Team's report (July 14, 1983) identified specific QA concerns and recommended followup actions by LP&L. Louisiana Power & Light responded in letters of September 29, 1983, and February 20, 1984, to the Director, NRC Office of Inspection and Enforcement (IE). The Inquiry Team worked onsite with the Task Force to evaluate the adequacy of LP&L's response. The Inquiry Team's findings are provided in Inspection Report 50-382/84-34 issued on July 20, 1984 (See Attachment No. 6).

On April 2, 1984, the Task Force began a six-week onsite effort to determine the validity of the allegations, to evaluate their safety significance, and to assess their generic implications.

The Task Force began by preparing action plan task sheets for each allegation that characterized it and outlined an approach to resolution planned for the allegation. In some cases, when a number of individual allegations were similar in subject, they were combined and evaluated together. In evaluating the allegations, the Task Force utilized various project documents, such as specifications, drawings, procedures, and instructions. This effort entailed the review of documents that were in place at the time of the allegations, as well as any subsequent revisions. Construction records for the various structural materials, including construction work packages, personnel qualifications records, inspection records, surveillance and audit reports, and other relevant documents, were also reviewed. Additionally, the Task Force gathered information from representatives of LP&L, from EBASCO (the architect-engineering firm) and from their subcontractors. The Task Force also examined

areas in the plant where only direct observation could provide needed information. And, as mentioned earlier, Task Force members met with some of the allegers to clarify allegations and discuss evaluation status.

Finally, the Task Force evaluated the facts gathered, the documentation examined, and the discussions held to determine the validity of each allegation. The safety significance was then determined, any generic implications were defined, and indications of potential management breakdown were noted. Where LP&L action was needed, the necessary action was requested.

This appendix contains the NRC staff's safety evaluation of each allegation or group of allegations. Each evaluation includes: (1) the allegation number; (2) a brief statement in plain English describing the allegation; (3) a summary of the Task Force evaluation process; and (4) as appropriate, action required of LP&L. The evaluation section includes, as appropriate, the safety significance of the findings with regard to the design, construction, operations, QA, and/or management controls; assessment of the generic implications of the findings; the root cause of the situation; and any management concerns identified.

The Task Force pursued its evaluation of allegations and their safety significance to wherever the information led. In some cases, the staff looked into an allegation and found it to be of no safety significance, but discovered a new concern unrelated to the original allegation. These new concerns were also carefully assessed. In all, the staff identified 23 areas of potential safety concern needing resolution prior to the staff's making its safety determination and licensing decision. In a letter to LP&L of June 13, 1984 (see Attachment No. 5)*, LP&L was requested to propose a program and schedule for a detailed and thorough assessment of staff concerns identified by the Task Force. The program plan would include and address the root cause of each of the 23 potential concerns identified; the generic implications on other safety-related systems, programs, or areas; and the collective significance of the deficiencies. The program plan should inc' de the action proposed by LP&L to assure that such problems will be precluded from recurring in the future. Louisiana Power & Light responded to the staff's request by letters of June 28, 1984 and July 27, 1984, with a proposed program plan.

The staff will complete its review of LP&L's response to the individual issues prior to making a licensing decision. The results of that review will be published in a supplemental Safety Evaluation Report.

In most cases, the staff found no generic implications for problems on safety-related systems. However, the staff recognized that some allegations had potential generic implications beyond the scope of the original allegation. As noted above, the staff identified 23 areas with potential safety significance, some of which had possible generic implications, and requested, in a letter of June 13, 1984, that LP&L evaluate the generic implications, as well as the potential safety significance, for these areas.

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* Included in Attachment No. 5 is a list cross referencing the allegation numbers in this Appendix to the 23 items in the June 13, 1984 letter.

In the following sections, the Task Force findings are summarized for the Civil and Structural, Piping and Mechanical, Instrumentation and Control, and QA Records Review Teams.

2.1.1 Civil and Structural Team Summary

2.1.1.1 Scope of Allegations

The allegations in the civil and structural discipline concerned most aspects of construction activity at the site, including materials, procedures, construction, testing, inspection, and maintenance. For example, allegations were made about the adequacy of the resolution of the material used directly beneath the nuclear plant island structure (the common concrete basemat and all the safety-related structures which rest upon it), as well as about the adequacy of records related to the soil backfill material surrounding the nuclear plant island structure (see Allegations A-114/144/154, A-138/159, and A-145).

There were initially a total of 87 allegations in the civil and structural discipline. Of these, 24 dealt with quality assurance issues and so were assessed by the Quality Assurance Records Review Team; two additional allegations were assessed jointly by the Quality Assurance and Civil and Structural Teams. Two allegations were addressed by the Instrumentation and Control Team and two others had been addressed in work previously done by NRC Region IV personnel. The remaining 54 allegations were consolidated by subject into 41 separate issues which the Civil and Structural Team evaluated.

Allegations about Cadwelding were related to improper certification of inspectors, missing and falsified records, the failure of inspectors to follow specification requirements on testing frequencies and splicer requalifications, unauthorized use of materials, and incorrect resolution of deficiencies identified in nonconformance reports (see Allegations A-106/108/133/156, A-147, A-107, A-109, A-115/155, A-146/157, A-147, A-158/272, and A-171).

There were also allegations made about the qualifications of craft, inspection (quality control), quality assurance, and engineering personnel, and about the installation, inspection, records, and acceptance of activities for waterstop material in the reinforced concrete structures (see Allegation A-129).

The largest number of civil and structural allegations concerned activities related to concrete construction. The allegations addressed violations of specifications and procedures, the use of unqualified and uncertified personnel in construction and inspection functions, the improper frequency of in-process tests, improper records reviews, missing and falsified records, improper classification of or failure to identify problems for entry in the quality system, and incorrect resolution of discrepancy notices and nonconformance reports (see Allegations A-109, A-110/130/148, A-111, A-112/131/269, A-116, A-141, A-270, and A-335).

These concerns taken together -- soil backfill materials, Cadwelding, waterstops, and concrete-related activities -- have resulted in allegations that construction practices may have led directly or indirectly to the cracks and water seepage observed on the concrete basemat of the nuclear plant island structure (see Allegation A-139/140).

Other allegations concerned the traceability of steel materials, weld rods, and coatings; the qualifications and certification of personnel; the inadequate inspections and documentation of as-built drawings; and the incorrect disposition of deficiencies in these areas, as well as the improper storage and in-place maintenance of construction materials (see Allegations A-030, A-160/161, A-168, A-169, A-177, A-182, A-256, A-258, A-259, A-260, A-268, A-271, A-298, and A-319).

Finally, there were allegations that problems or deficiencies identified during construction were reported on documents which had not been reviewed or considered because they were outside the formal quality review program, and that there was pressure on personnel not to report these issues formally as nonconformances (see Allegations A-132, A-134, A-136, and A-170).

In addressing the allegations, the Civil and Structural Team characterized them into specific areas where possible, while recognizing that some allegations involved generic implications about the problems they raised. The allegations and related facts compiled by the team were consolidated after each allegation had been fully assessed for technical issues. They were consolidated so that similar allegations could be evaluated for their possible generic implications.

2.1.1.2 The Civil and Structural Team

Members of the Civil and Structural Team were selected on the basis of their technical expertise and experience in engineering design, quality assurance and document control, inspection, construction, project management, enforcement, and for their ability to detect discrepancies and irregularities while addressing and resolving technical issues. The eight NRC team members included representatives from NRC's Office of Nuclear Reactor Regulation, the Office of Nuclear Regulatory Research, the Office of Inspection and Enforcement, and the Region IV Office. One team member was employed by an NRC contractor. In total, the team represented 150 years of engineering experience, of which 90 years were in the nuclear industry. The team also had the support of a consultant responsible for independently evaluating concrete construction controls and problems and their possible effect on structural behavior and integrity. The consultant has 38 years of management, engineering, and construction experience in the area of concrete construction.

2.1.1.3 Findings for Civil and Structural Issues

The team found that most of the allegations related to missing records, discrepancies in records, and incomplete reviews during mid-1983 were generally true. Since that time, it is apparent that LP&L has put a great deal of effort into the task of assembling existing records and in analyzing and resolving record discrepancies. EBASCO completed records reviews for soils, concrete placement packages, and structural steel. The team did, however, find areas where there are still issues to be resolved, either by facts which can be obtained from records, if they can be located, or by additional field testing, inspection, and evaluations.

The team concluded that the significant discrepancies related to clam shell placement and construction have been identified and satisfactorily resolved because records in this area accurately reflect the actual construction. With regard to the soil backfill activities, the team's sample review of records

after LP&L reviewed all records revealed some missing records of in-place density tests and errors in the physical location of test samples. Louisiana Power & Light is required to resolve this issue (see Allegations A-138/159 and A-145).

The team found that many Cadwelding issues raised in the allegations had subsequently been satisfactorily addressed, although others remain unresolved. The team found that, as a result of findings by an NRC Construction Appraisal Team inspection conducted in February and March 1984, one nonconformance report on the subject of Cadwelds which addressed multiple issues had been reopened because all issues had not been adequately resolved. The team found discrepancies in the number of Cadwelds installed, rejected, and tested, as well as in other related data. As a result, LP&L is required to assemble all Cadweld data into a format which will allow the quality of the in-place material to be evaluated. Any deviations from the project specifications and procedures can then be identified by building or structural component and can be assessed against necessary margins for acceptability (see Allegation A-146/157).

The team reviewed allegations for concrete placement activities and found no major deficiencies relative to structural adequacy. While the team did identify deviations from project specifications and industry standards, a review of the specific details and impact of these deviations resulted in no reduced confidence in the structural adequacy of the concrete, consistent with the design assumptions. The team did identify some minor discrepancies in the concrete placement records, but these were not of safety significance.

The NRC team and its independent consultant have concluded that there have been no significant detrimental effects to the basemat because of deviations and deficiencies which arose during its construction. (See Attachment No. 2 for the text of the consultant's report.) Further, the team concluded that the observed cracking and seepage through the basemat are not likely to have been caused or aggravated by construction deviations and deficiencies. The team found an abandoned electrical conduit used during construction filled with water to a level above the top of the basemat. Louisiana Power & Light is required to assure that all direct paths through the basemat are properly sealed (see Allegation A-139/140).

The team found incomplete records for safety-related structural steel after randomly sampling records which were outside the scope of the quality re-review program (see Allegation A-030). The records pertain to the bolting and inspection of the completed work for framing supporting the main steamline restraints above the steam generators, conducted by one major supplier.

The team identified two welding problems which must be addressed by LP&L. The first problem involved welds for the support of several instrumentation cabinets inside the containment building. The team could not determine if the welds had been made by a welder qualified in that position. The second problem was that the team was urable to verify the weld rod and welder identification for welds supporting the containment building spray system rings in the top of the building (see Allegations A-160/161 and A-269, respectively).

In reviewing information related to inspector qualifications and certification, the team found numerous waivers for length of experience that allowed inspectors to qualify at Levels I, II, and III, as defined by ANSI N45.2.6. Even though the procedures in some cases stated that these requirements were not meant to be absolute, they allowed greater leniency than ANSI 45.2.6 intended. LP&L is required to take action to provide additional confidence in the work completed by such inspection personnel (see Allegation A-110/130/148).

Finally, the team found documents existing outside the formal quality review program, such as speed letters and requests for information, that may yield safety-related information on construction activities. However, based on the team's review of these documents, it is not expected that any of these items will be of any major safety significance in this area (see Allegation A-132).

In general, the team found that the procedures put in place as early as 1975 and 1976 to control work and inspections were detailed and more than adequately provided for necessary quality control in the civil and structural discipline. The team also found that these procedures had generally been followed, except in certain instances which have now been evaluated. The team found that most deficiencies identified during the construction process were generally evaluated, although there were instances of items which may not have been properly classified. The team believes these situations occurred because of overlapping definitions in the procedures for nonconformances, discrepancies, and deficiencies.

Assessing the project nearly nine years after the start of the major civil and structural work, the team concluded that the quality review of records was initiated late in the project. If the reviews had more closely followed the actual work, it is probable that the magnitude of the current effort would have been greatly reduced.

2.1.2 Mechanical and Piping Team Summary

2.1.2.1 Scope of Allegations

The allegations in the mechanical and piping discipline concerned the design, construction, and documentation of piping and supports. The allegations included concerns about the control of design changes and field changes, the traceability of materials used, the size of welds, conformance to the ASME Code in conducting hydrostatic tests on piping, the functioning of QA in recordkeeping, and the disposition of certain nonconformances and discrepancies.

There were a total of 42 allegations in the mechanical and piping discipline. Of these, 28 were evaluated by the Mechanical and Piping Team. The original 28 were consolidated by subject into 16 allegations. The remaining 14 allegations were QA related and were assessed by the Quality Assurance Records Review Team.

The allegations in the mechanical and piping discipline were categorized into the following general topics. The numbers in parentheses refer to the writeups for each topic.

Some allegations concerned verification of shop weld inspections during piping hydrostatic tests conducted by Tompkins-Beckwith (T-B) (see Allegation A-296), as well as the adequacy of test pressure during tubing hydrostatic tests

conducted by Mercury (see Allegation A-088/089/090/091/315). According to the ASME Code, all welds shall be inspected for leakage during hydrostatic testing, test pressure shall meet a specified level, and such information shall be properly documented.

Allegations were also made that Mercury piping welds were undersized (see Allegation A-128d/212/275) and that skewed angles of joined steel members may not have been considered in determining the weld size in T-B constructed piping supports (see Allegation A-336). The ASME Code requires that piping welds be sized in accordance with pipe wall thickness, and the AWS specification requires that the skew angle of a joined steel member should be considered in determining the weld size.

There was an allegation that the traceability requirements of permanent attachment material welded to Class 1 and 2 piping pressure boundaries by T-B were not satisfactorily resolved by EBASCO Engineering because of nonconformance to the ASME Code (see Allegation A-226). It was alleged that the nonconformance was incorrectly resolved and closed by EBASCO. Concerns about material traceability also resulted in allegations with regard to piping and tubing supports and brackets installed by Mercury and T-B (see Allegations A-072/076/077/347 and A-126/291).

Allegations were also directed against the adequacy of T-B and Mercury procedures to ensure that the as-built piping supports and hangers, after being modified or replaced, were maintained in the design-verified condition (see Allegations A-023b and A-211). Some allegations concerned the adequacy and ASME Code conformance of welding procedures for piping and supports installed by T-B (see Allegations A-023c and A-061a) and Mercury (see Allegation A-337).

Other allegations concerned record-keeping problems related to piping hangers and supports installed by T-B and Mercury (see Allegations A-252 and A-267); to welding material and welding procedures at containment penetrations of T-B-installed piping (see Allegation A-020/021/022); and to material compatibility of backing rings used in the T-B-installed piping (see Allegation A-303a).

2.1.2.2 The Mechanical and Piping Team

The NRC team for evaluating mechanical and piping allegations consisted of seven members from NRC's Office of Nuclear Reactor Regulation, NRC's Region IV Office, and contractors from a national laboratory and consulting firms. They were selected on the basis of their technical expertise needed for the review of the allegations at Waterford 3. The team members have 149 years of experience in the review of mechanical design, in-field inspections of nuclear plant components, in quality assurance and documentation control, and in ASME Code interpretation and applications.

2.1.2.3 Findings for Mechanical and Piping Issues

Details of evaluation findings in the mechanical and piping discipline are contained in 16 writeups. Each writeup may cover several allegations, all of which relate only to one subject. The team found most of the allegations were true at the time the allegations were made.

The Mechanical and Piping Team, utilizing the assistance of a leading ASME Code expert, reviewed whether the T-B piping and tubing hydrostatic testing programs conformed to ASME Code requirements. The team review verified that the hydrostatic testing conducted did meet the Code requirements, except that verification should be provided by LP&L to confirm inspection of shop welds for leakage during the piping hydrostatic tests. The lack of confirmation on shop weld inspections may constitute a violation of the ASME Code (see Allegations A-296/306a/306k/306l/306m and A-088/089/090/091/315).

The team reviewed welding documents and inspected as-built piping supports to determine if certain welds were undersized. The team found that skewed angles were considered by T-B in determining the weld size for joined steel members. The undersized Mercury tubing welds were reworked and upgraded to the size required by the design specifications. In addition, the strength of Mercury tube track welds was found more than adequate to meet the design loads through testing verifications (see Allegations A-128d/212/275 and A-336).

The team reviewed conformance to the ASME Code regarding material traceability of T-B welded attachments to Class 1 and 2 piping pressure boundaries and found that records were properly documented. As for allegations on material traceability for T-B and Mercury piping or tubing brackets and supports, the team found that subcontractors added unnecessary requirements of material traceability to the original requirements delineated in EBASCO specifications for structural steel. The subsequent changes back to the original requirement resolved the alleger's concern (see Allegations A-226, A-072/076/077/347, and A-126/291).

The allegations on the adequacy of procedures to verify T-B and Mercury piping support installation and welding was investigated. After reviewing documentation and inspecting the as-built conditions of piping supports and piping welds, the team found that the procedures were in conformance with specifications and were properly implemented (see Allegations A-023b, A-211, A-023c, A-061a, and A-337).

The allegations on recordkeeping problems represented an accurate condition at T-B and Mercury during certain construction periods. The contractors or subcontractors did not appear to have corrected the conditions which caused the allegations to be made. Subsequent corrective action, however, resolved these documentation deficiencies in this area. (See Allegations A-252, A-267, A-020/021/022, and A-303a).

In conclusion, LP&L shall provide verification to the NRC staff of shop weld inspection for leakage during piping hydrostatic tests.

2.1.3 Instrumentation and Control Team Summary

2.1.3.1 Scope of Allegations

The allegations in the instrumentation discipline involved most aspects of construction activity, including design, materials, installation procedures and documentation, testing, and inspection. There were originally 14 allegations in this discipline, which were consolidated by subject matter into nine areas. One of these (see Allegation A-268) was deemed more appropriate to the Civil and Structural Team and was transferred to them for assessment.

The remaining eight areas were grouped into four categories: instrumentation sensing line adapters; instrument sensing line tubing; instrument sensing line tube track; and instrument and air system tube track supports and hangers.

Allegations were made which related to the material traceability of 1/2- to 1-inch line adapters in safety-related instrumentation systems. It was alleged that the utility purchased adapters for non-safety application and that these "unqualified" adapters were installed in safety-related systems (see Allegation A-220/233/235/236/251).

There were allegations regarding the installation of the instrument sensing line tubing, both with respect to the lack of high point vents, and to the inadequate slope of the lines (see Allegations A-242 and A-224/228). An allegation was also made that the track for the instrument tubing was not made of the correct material (see Allegation A-264, part 1), and that the tube had been installed with insufficient clearance from the track (see Allegation A-264, part 2).

The largest number of allegations involved the tube track supports and hangers. These involved the hanger inspection criteria (see Allegation A-222/231), rework of seismic hangers (see Allegation A-273), and proper heat numbers for the supports (see Allegation A-265).

Finally, one allegation involved the instrument air system. This concern dealt with documentation as to the capability of the air system to withstand an earthquake and the potential for any resulting impact on safety-related equipment (see Allegation A-225).

2.1.3.2 Instrumentation and Control Team

The members of the Instrumentation and Control Team were assembled based on their technical expertise, capabilities, and experience in engineering design, quality assurance and document control, inspection, construction, project management, and regulatory activities. The team included one member from NRC's Office of Inspection and Enforcement, another from the Office of Nuclear Reactor Regulation, and two consultants. In total, the team represented well over 50 years of experience in instrumentation and electrical work involving nuclear power.

2.1.3.3 Findings for Instrumentation and Control Issues

The Instrumentation and Control Team concluded that most of the allegations were true. Of the eight instrumentation areas evaluated, two have potential safety significance and potential generic implications. Louisiana Power and Light is required to provide more information to the NRC staff before these issues can be resolved.

The team concluded that, although there was a possibility that unqualified adapters (that is, those with no heat number identification) had been installed in safety-related systems, LP&L took adequate corrective action to assure that such adapters were replaced with qualified adapters (see Allegation A-220/233/235/236).

With regard to the instrument sensing line tubing, the team concluded that, although the utility violated its commitment to include high point vents in the lines, alternate provisions had been made to vent air from the lines during hydrostatic testing. In addition, although violations of its slope criteria were identified, the team concluded that LP&L had made a case-by-case analysis to accept or modify each such instance (see Allegations A-242 and A-224/228).

The team concluded that the allegation regarding the tube track material was not valid because the material which was alleged to be non-safety material was not, in fact, the tube track material actually utilized (see Allegation A-264, part 1). Also, the allegation regarding the criteria for insufficient instrument tubing clearance from the tube tracks was shown to be adequately addressed by subsequent LP&L corrective actions (see Allegation A-264, part 2).

The allegations regarding the supports and hangers involved a number of separate issues. The allegation that documentation indicating heat numbers had been modified to reflect the correct heat numbers in the field was substantiated. However, this finding was determined to be of no safety signficance because all the material was identified with a heat number indicating that the material was safety related (see Allegation A-265). The allegation regarding inspection criteria for anchor bolts in safety-related hangers was also substantiated and additional reinspection of anchor bolt installation will be necessary (see Allegation A-222/231). The allegation regarding the rework of a number of seismic hangers was shown to be moot because the reinspection had addressed all the hangers of concern (see Allegation A-273).

For the other instrumentation allegation, which involved the instrument air system design and its conformance to Regulatory Guide 1.29, the team determined that additional information and documentation was required. The applicant was requested to provide the additional information. (See Allegation A-225).

In conclusion, the Instrumentation and Control Team finds that LP&L will have to address instrument air system design and its conformance with Regulatory Guide 1.29, as well as reinspection of anchor bolt installation.

2.1.4 Quality Assurance Records Review Team Summary

2.1.4.1 Scope of Allegations

The NRC Quality Assurance (QA) Records Review Team reviewed 217 allegations pertaining to the overall QA program and its implementation. After assessing each allegation on its own merits and for its generic implications, the team grouped the allegations into 37 subject categories. These categories included allegations about unqualified QA inspectors, records reviewers, and welders; inadequate and falsified QA documentation; improper disposition of nonconformances; drawings that did not reflect as-built conditions; lack of material traceability; and improper changes to ASME Code data reports and record packages.

In evaluating the allegations, the team utilized both random and biased sampling techniques. Random samples were taken from QA records, logs, inspector and welder listings, and other documentation, while biased samples came from information obtained from the allegers and from trends found during the team review.

2.1.4.2 The Quality Assurance Records Review Team

The QA Records Review Team was made up of 19 members who, collectively, represented approximately 300 years of experience in QA record reviews and audits, ASME Code interpretation, nuclear power plant inspection, testing and evaluation of materials, reactor construction and operation, instrumentation, and other pertinent disciplines. Team members were drawn from NRC's Office of Nuclear Reactor Regulation and Office of Inspection and Enforcement, from NRC's Region III and IV Offices, and from the staff of a national laboratory.

2.1.4.3 Findings for QA Records Review Issues

The QA Records Review Team found that half of the allegations they reviewed were substantiated. Of the 37 categories reviewed, the team found eight areas that indicate a breakdown of the overall QA program and have potential safety significance and generic implications.

The first of these areas involved unqualified or incorrectly certified QA/QC inspection personnel. Approximately 35 percent of the inspectors for two site contractors were not qualified to be certified. The team found that background checks had not been made. The issue of a few potentially falsified resumes is under review by OI (see Allegations A-001, A-002/208/274, A-028, and A-057/314).

The team found the QA documentation inadequate. Problems included missing documentation for instrumentation installation, for in-process and final inspections, for welder identifications, and controls, and for base and filler material identification and controls related to the reactor coolant system (see Allegation A-197 through 206/213/216).

The third area of potential safety significance and generic implications involved inadequate review of QA documentation. The team found a violation of separation criteria for the installation of instrumentation tubing for the reactor coolant system (see Allegation A-279/280/282/284/288/027).

The team found many cases of inadequately dispositioned and closed nonconformance reports and discrepancy reports. Approximately 38 percent of EBASCO and Mercury nonconformance reports had problems, some of which included: missing documentation to support corrective action closure; lack of proper review for reportability in compliance with 10 CFR 50.55(e) for construction deficiencies; improper identification and resolution for an instrumentation tubing defect; no basis for voiding a nonconformance report; voided nonconformance reports missing from the QA files; the qualification of a welder was not based on the required welding test; a forged signature was discovered on an inspection report; a generic problem was detected for nonconformance reports in that action to prevent recurrence was not addressed; and over 200 nonconformance reports were open indicating that corrective action is incomplete even though the plant is essentially complete. (For EBASCO nonconformance reports, see Allegations A-033/055/056/061/067/068/069/070/071/073/074/075/309/329/306v & w/221, A-018/164, and A-049/078/087/123.) (For Mercury nonconformance reports, see Allegation A-232/234/237/238/243/244/245/262/311/312/313/316/317/318/320/321/323/324/325/326/327/328/331.)

Also, there were problems with EBASCO discrepancy reports. Closure references were incorrect or inappropriate; closure action was improper; documentation was inaccurate or incorrect; and disposition failed to address the discrepancy (see Allegation A-005).

Another potential problem area identified by the team involved inadequate welder qualifications and welding filler material control. Problems included welders not qualified to the correct welding procedure, and inability to locate qualification records. Also, welding filler material was not controlled as required by the ASME or AWS Codes for low hydrogen electrodes for the rebaking process. The allowable issuance time frame was exceeded, and the requirements for drying electrode coatings were not complied with (see Allegation A-215/175/240/239/306i).

The team found corrective action documents that were not upgraded to nonconformance reports. Problems were found with the required corrective action system for upgrading certain documents to nonconformance reports. The documents not upgraded, and the percentages of them not upgraded, included: field change requests (55 percent); design change notices (29 percent); engineering discrepancy notices (60 percent); and deficiency notices (12 percent). Some documents had not received the proper EBASCO review, identification, corrective action, or closure, or had not received review for reportability to 10 CFR 50.55(e) (see Allegation A-302/307/306b/306s/306x).

Another area of potential safety significance and generic implications involved vendor documentation. The conditional release system for issuance of material, items, or components for installation was not complied with. Some equipment was received at the site with missing or incorrect documentation, such as technical manuals, as-built drawings, test/calibration results, and certified material test reports. These problems were not properly documented by LP&L or EBASCO. Some of these problems have existed since 1976. The EBASCO system in place for other conditional release items had identified and tracked various problems, but had failed to resolve the problems in a timely manner (see Allegation A-165/166/292/293/297/299/300).

Finally, the team confirmed a QA program breakdown between LP&L, EBASCO and Mercury. In December 1982, the NRC took enforcement action against LP&L for a QA program breakdown and imposed a civil penalty. During this current QA review, the team found that LP&L had failed to take adequate corrective action. Additionally, LP&L, EBASCO, and Mercury failed to perform their audits as required and failed to take the required corrective action. Management audits performed by outside consultants identified problems and concerns for which LP&L also failed to take proper corrective action. The team found from this review that an overall QA program breakdown did exist, and that LP&L's failure to determine the root cause and their lack of comprehensive corrective action has allowed the breakdown to continue (see Allegation A-048/295).

For the eight problem areas identified by the QA Records Review Team, LP&L shall submit a plan to the NRC identifying the safety significance of each issue together with an approach to resolution, including proposed corrective action and time frames for plan execution and completion.

3. SUMMARY

Based on its review of the 350 allegations and related information received to date of poor construction practices at the Waterford 3 site, the NRC Task Force staff makes the following observations and conclusions.

1. The applicant's construction quality assurance program in the Preliminary Safety Analysis Report (PSAR) was found acceptable by the NRC staff during its Construction Permit Review between December 1970 and November 1974.

2. Quality Assurance activities during most of construction were principally delegated to the major contractor, EBASCO, by the utility. The lack of a fully staffed and effective utility QA program, along with EBASCO's failure to fully carry out the QA responsibilities delegated to them, led to quality problems during construction.

3. The staff verified the allegations that the project document requirements were not fully met. The staff determined that this contributed to the quality problems at Waterford.

4. The number and diversity of the problems found is indicative of a program that is not meeting its objectives and requirements. The staff has found that the majority of the problems evaluated to date, in and of themselves, do not have an adverse impact on safety.

5. Of principal concern to the staff are 23 items identified by the NRC staff in its letter of June 13, 1984, to the applicant. These items may have an impact on safety.

6. Potential violations of NRC regulations identified by the Task Force are being forwarded to the NRC Office of Inspection and Enforcement and to the Administrator, NRC Region IV Office for appropriate action.

7. The NRC Office of Investigations is currently conducting nine investigations of alleged wrongdoing. Additional potential violations may result from these investigations.

APPENDIX J

STATUS OF STAFF RESOLUTION OF ALLEGATIONS OR CONCERNS ABOUT THE CONSTRUCTION AND OPERATION OF WATERFORD UNIT 3

NUMERICAL ALLEGATION LISTING

Allegation Number	Characterization	Page Number
A-239	See A-215.	
A-240	See A-215.	
A-241	Information only. Document entitled, "What is Deliberate Malpractice."	
A-242	Hydrostatic tests performed without the use of high point vents are valid. This allegation raised additional concerns about the adequacy of instrument tubing installations relative to sloping requirements .	~~217~~ ~~219~~ 220
A-243	See A-232.	
A-244	See A-232.	
A-245	See A-232.	
A-246	Information item. Individual was fired for taking kickbacks.	
A-247	NRC Office of Investigations issue.	
A-248		
A-249	EBASCO DNs were written and given to subcontractors who would process the DNs through their own engineering/QA personnel and would then either change the documentation or walkdown a system to eliminate the discrepancy, at which time the DNs would be discarded .	~~219~~ ~~221~~ 222
A-250	NRC Office of Investigations issue.	
A-251	See A-220.	
A-252	An EBASCO interoffice letter, W3-QA-23661 (March 4, 1983), was "an example of correspondence written to cover up problems discovered in the documentary review group."	220 ~~222~~ 223
A-253	Vendor Report Reviewers were not qualified to assure requirements were met and some vendor records were bad, particularily those for Bergen-Patterson, a subcontractor of Dravo	~~221~~ ~~223~~ 224
A-254	See A-253.	
A-255		
A-256	CB&I had problems with protective coatings and material traceability for the inside of the containment vessel .	~~223~~ ~~225~~ 226

Allegation Number	Characterization	Page Number
A-270	The concerns mentioned in a document called an "after-action report" written by an EBASCO QC civil engineer (dated December 15, 1975) on the common foundation basemat, Block No. 2 (placement sequence 3) have never been properly addressed or resolved	~~236~~ ~~238~~ 239
A-271	Improper consideration was given to upgrading the process for cleaning and coating the interior of the containment vessel	~~238~~ ~~240~~ 241
A-272	See A-158.	
A-273	Incomplete QC field verification of corrective action prior to close of EBASCO NCR W3-2333; i.e., not all hanger supports were reviewed for seismic qualification.	~~239~~ ~~241~~ 242
A-274	See A-02.	
A-275	See A-128d.	
A-276	In one case the QA Manager for Mercury directed the Mercury Training Office to change the resume of one inspector to reflect more experience than the individual actually had	~~240~~ ~~242~~ 243
A-277	Information only. Dates alleger worked at Waterford 3.	
A-278	NRC Office of Investigations issue.	
A-279	Inadequate documentation reviews were performed by T-B, EBASCO, and Mercury in that open deficiencies were found in packages which had been reviewed and accepted.	~~241~~ ~~243~~ 244
A-280	See A-279.	
A-281	See A-32.	
A-282	See A-279.	
A-283	The process for initiating NCRs was discouraging . . .	~~243~~ ~~245~~ 246
A-284	See A-279.	
A-285a	See A-100.	
A-285b	See A-304.	
A-286	T-B record reviewers falsified heat numbers to demonstrate adequate traceability	~~244~~ ~~246~~ 247
A-287	NRC Office of Investigations issue.	

Allegation Number	Characterization	Page Number
A-304	Changes to QA documentation were made by a T-B records reviewer who was not a QA inspector	~~259~~ ~~260~~ 262
A-305	See A-304.	
A-306a	See A-296.	
A-306b	See A-226.	
A-306c	Lack of EBASCO traceability documents on bolts measuring one inch or less	~~260~~ ~~262~~ 263
A-306d	Information only. Memo W3 QAIRG-0561, June 16, 1983. Guidelines for QAIRG review of T-B generated isometric drawings.	
A-306e	Concerns a specific letter (File Reference W3-QAIRG-0420) enclosing NCR W3-5077 and the associated disposition noted for NRC staff review for adequacy of disposition	~~261~~ ~~263~~ 264
A-306f	See A-226.	
A-306g	See A-229.	
A-306h	Information only. Memo W3-QAIRG-0613, July 15, 1983. Memo discussed piping reviewers work hours.	
A-306i	See A-215.	
A-306j	See A-308.	
A-306k	See A-296.	
A-306l	See A-296.	
A-306m	See A-296.	
A-306n	Information only. Could not find referenced document B2.1, 4/13/83. These numbers were not in the normal file reference format.	
A-306o	See A-226.	
A-306p	See A-226.	
A-306q	Information only. W3-QAIRG-455, April 28, 1983. Certificates of Compliance will be reviewed by T-B ANI. QAIRG piping reviewers will not be required to review C of Cs.	

Allegation Number	Characterization	Page Number
A-306r	See A-308.	
A-306s	See A-302.	
A-306t	Noncertified document reviewers were making changes to QA documentation	~~262~~ ~~264~~ 265
A-306u	T-B did not adequately control measuring and test equipment	~~263~~ ~~265~~ 266
A-306v	See A-33.	
A-306w	See A-33.	
A-306x	See A-302.	
A-306y	Information only. Transmittal of T-B Open Item Listing, Revision 16, June 30, 1983.	
A-306z	See A-306u.	
A-307	See A-302.	
A-308	The piping system documentation of various contractors and LP&L is inadequate and it cannot be verified that piping systems were installed and inspected in accordance with the ASME Code	~~264~~ ~~266~~ 267
A-309	See A-33.	
A-310	See A-33.	
A-311	See A-232.	
A-312	See A-232.	
A-313	See A-232.	
A-314	See A-57.	
A-315	See A-88.	
A-316	See A-232.	
A-317	See A-232.	
A-318	See A-232.	
A-319	EBASCO closed NCRs on instrumentation support weld deficiencies prior to protective coating application .	~~266~~ ~~268~~ ~~269~~ 270

Allegation Number	Characterization	Page Number
A-320	See A-232.	
A-321	See A-232.	
A-322	See A-64.	
A-323	See A-232.	
A-324	See A-232.	
A-325	See A-232.	
A-326	See A-232.	
A-327	See A-232.	
A-328	See A-232.	
A-329	See A-33.	
A-330	NRC Office of Investigations issue.	
A-331	See A-232.	
A-332	Allegation includes: (1) DCN-MP-920 is inadequate, (2) welder certification is questionable for welding on piping between the spent fuel pool and the low pressure safety injection pump and the suction line from the condensate storage to the emergency feedwater pump, and (3) N stamp and code classification on lines as signed by inspector B07783215 are questionable . . .	~~267~~ ~~270~~ 271
A-333	See A-332.	
A-334	See A-332.	
A-335	Documentation does not exist to verify that inspectors who signed concrete curing records for the reactor containment building dome and parapet wall were on site over weekends in order to implement procedures requiring that concrete being cured be monitored once a day for seven consecutive days	~~268~~ ~~271~~ 272
A-336	Skewed angles were not taken into account by T-B on the specification of weld size for pipe supports having members joined at various angles	~~269~~ ~~272~~ 273

Allegation Number	Characterization	Page Number
A-337	Allegation is twofold: (1) Mercury instrumentation and control tube track welding should have been performed to the requirements of AWS welding specification D1.3 for sheet metal rather than AWS welding specification D1.1 for structural steel, and (2) because Mercury procedure 658 was revised on March 15, 1983, to include AWS D1.1 welding requirements, any tube track welding performed prior to this time may be inferior and should be reviewed and upgraded, if necessary, to the revised procedure .	~~270~~ ~~273~~ 274
A-338		
A-339		
A-340	Cable trays were not cleaned prior to installation of cable tray covers	~~272~~ ~~274~~ 275
A-341	Deformed cable trays were "cinched up with a come-a-long" in order to install the cable tray covers	~~273~~ ~~276~~ 277
A-342	Potential issue for NRC's OIA.	
A-343	Potential issue for NRC's OIA.	
A-344	Potential issue for NRC's OIA.	
A-345	Potential issue for NRC's OIA.	
A-346	See A-32.	
A-347	EBASCO's Nonconformance Report (NCR) W3-6514 was incorrectly resolved and closed, and uncertified steel was used for instrument tubing supports	~~274~~ ~~277~~ 278

TOPICAL ALLEGATION LISTING

Quality Assurance

Allegation Number(s)	Characterization
A-01; A-02; A-03; A-28 A-57, A-304	Unqualified or incorrectly certified QA/QC inspection personnel.
A-04; A-209	QC inspections were inadequate.
A-05	EBASCO QA personnel used speed letters instead of of deficiency notices (DNs) to identify problems on system turnover documentation packages.
A-06; A-294; A-09; A-92; A-289b	Untrained or unqualified QA records reviewers.
A-07; A-117; A-172; A-276; A-286	Falsification of QA documentation.
A-08	EBASCO QA records and documents were not stored in fire safes over night and some records were being stored in a warehouse in old file cabinets and boxes.
A-13; A-19; A-340; A-341	Uncorrected electrical deficiencies.
A-18	Six EBASCO nonconformance reports (NCRs) were not not included in the NCR system; i.e., inadequate nonconformance control.
A-26	Nonconforming conditions may not have been properly identified and corrected by EBASCO.
A-32;	As-built drawings do not reflect actual plant configuration and EBASCO QA document reviewers were told to change redline drawings for T-B.
A-33; A-59; A-227; A-232	NCRs improperly dispositioned and closed without substantiating indications.
A-35; A-183a; A-197 A-223; A-230; A-308	QA documentation and records were inadequate.

Allegation Number(s)	Characterization
A-36	Torque wrench was 38 percent under calibrated.
A-39,	Nitrogen purge on piping system not performed.
A-43	Improperly performed calibrations, including improper humidity and temperature control in a test lab (office trailer).
A-48	Complete breakdown in the QA program between EBASCO and the Mercury Construction Company.
A-49; A-53; A-283	Personnel were not free to write NCRs; indications that the nonconformance control program was nonexistent.
A-54	Failure of EBASCO and site subcontractors to implement their procedures.
A-58	Many permanent plant items were not maintained by subcontractors, EBASCO, or LP&L; items were rusting in place.
A-63	Equipment not properly aligned or levelled when installed.
A-64	EBASCO site letters F-63724E, F-618958, and F-6147E imply that Mercury inspection activities may be unacceptable.
A-81	Changes made to N-5 documentation in packages for instrument lines without the knowledge of the Authorized Nuclear Inspector (ANI) after his approval signature.
A-94; A-100; A-214	Lack of material traceability.
A-143; A-186b; A-188 A-279	Review of QA documentation was inadequate.
A-165; A-253	Problems with vendor QA personnel and vendor QA documentation.
A-185	Written procedure does not exist for joint Mercury/EBASCO review of system turnover documentation.
A-186a	EBASCO QA surveillance did not monitor contractor work activity such as documentation.
A-187	Mercury instrumentation drawings were not correct because field changes were not incorporated into the drawings.

Allegation Number(s)	Characterization
A-196	An EBASCO Document Control Supervisor was not qualified for the position.
A-207	Mercury QA personnel were observed throwing away original documents after copies were made.
A-215; A-332	Inadequate welder qualifications and welding problems.
A-229	An individual was directed to turn over Operational Control Records (OCR) packages before system reviews were completed and the resulting documentation and hardware discrepancy lists submitted to LP&L documented inadequate reviews.
A-249	EBASCO DNs were written and given to subcontractors who would process the DNs through their own engineering/QA personnel and would then either change the documentation or walkdown a system to eliminate the discrepancy, at which time the DNs would be discarded.
A-263	A Mercury Construction Superintendent did not agree with Mercury audit findings and refused to correct problems identified.
A-290	The disposition of corrective action documents was not adequate to correct the deficiency and changes were incorrectly made to QA records.
A-302	Lower tier corrective action documents were not being upgraded to NCRs. Also, FCRs, DCNs, and EDNs were issued after the fact for nonconformances in lieu of NCRs.
A-306c	Lack of EBASCO traceability documents on bolts measuring one inch or less.
A-306t	Noncertified document reviewers were making changes to QA documentation.
A-306u	T-B did not adequately control measuring and test equipment.

Instrumentation/Control

Allegation Number(s)	Characterization
A-23a; A-24	Adequacy of response to problems and comments on containment building electrical penetrations by Fischbach & Moore.
A-220; A-264-1; A-265	Material traceability problems (with heat numbers) for instrument tube adapters, tube hangers and tube track.
A-222	Mercury Construction Company's concrete expansion anchor installation and inspection procedure does not insure that physical characteristics are inspected for conformance to installation requirements.
A-224	This allegation details a number of concerns regarding the "Hydrostatic or Pneumatic Testing Procedure" (MCP-2170), which was used by Mercury to test plant instrumentation systems.
A-225	Concern regarding the supports for non-safety instrument air piping not meeting guidelines in Regulatory Guide 1.29 was never resolved.
A-242	Hydrostatic tests performed without the use of high point vents may not be valid. This allegation raised additional concerns about the adequacy of instrument tubing installations relative to sloping requirements.
A-264-2	Installation adequacy of the instrument tubing regarding slope and interference of track and tube.
A-273	Incomplete QC field verification of corrective action prior to close of EBASCO NCR W3-2333; i.e., not all hanger supports were reviewed for seismic qualification.

Mechanical/Piping

Allegation Number(s)	Characterization
A-20	Nine general areas of concern: 36 specific record-keeping problems related to penetrations 38 and 65. Similar record-keeping problems with eight other penetrations. Included are improper drawing changes, incorrect identification of some heat codes and welds, and improperly altered dates for some welds.
A-23b	T-B piping installation procedures did not contain provisions to assure that supports and hangers were maintained in the design-verified condition and that hanger removals on modifications may have been made without conformance to an approved procedure.
A-23c	Six allegations concerned with the adequacy of T-B welding procedures and techniques.
A-25	Chicago Bridge and Iron (CB&I) QA record deficiencies pertaining to welding on containment building penetrations which could affect the integrated leak rate test (ILRT).
A-61a	EBASCO NCR W3-4504 should be reviewed by the NRC.
A-88	Failure of contractor to provide pipe hydrostatic test results. Test documentation provided may also have been faulty.
A-126	T-B material traceability program was inadequate and records were altered to include wrong heat numbers.
A-128d	Undersized welds performed by Mercury, as reported in a newspaper article of January 14, 1984.
A-211	Mercury program for maintaining identification of instrumentation tubing hangers and supports during rework was not effective.
A-226	The traceability requirements of permanent attachment material welded to Class 1 and 2 piping pressure boundaries by T-B were not satisfactorily resolved by EBASCO engineers.

Allegation Number(s)	Characterization
A-252	An EBASCO interoffice letter, W3-QA-23661 (March 4, 1983), was "an example of correspondence written to cover up problems discovered in the documentary review group."
A-267	Some Mercury nonsafety-related pipe hangers were placed in safety-related areas and the resulting documentation was falsified.
A-296	T-B may have violated the ASME Code requirements by failing to visually examine the shop pipe welds for leaks during hydrostatic tests.
A-303a	See A-302.
A-336	Skewed angles were not taken into account by T-B on the specification of weld size for pipe supports having members joined at various angles.
A-337	Allegation is twofold: (1) Mercury instrumentation and control tube track welding should have been performed to the requirements of AWS welding specification D1.3 for sheet metal rather than AWS welding specification D1.1 for structural steel, and (2) because Mercury procedure 658 was revised on March 15, 1983, to include AWS D1.1 welding requirements, any tube track welding performed prior to this time may be inferior and should be reviewed and upgraded, if necessary, to the revised procedure.
A-347	EBASCO's Nonconformance Report (NCR) W3-6514 was incorrectly resolved and closed, and uncertified steel was used for instrument tubing supports.

Civil/Structural

Allegation Number(s)	Characterization
A-30	Field installation of the main steam line framing restraints inside the containment building (ele. +46 and up) are not consistent with the as-built drawings.
A-107	False documents were generated to replace missing records related to Cadweld activities.
A-109	EBASCO QA review stopped with only 70 of 1200 concrete packages reviewed.

Allegation Number(s)	Characterization
A-110	Seventeen inspectors from EBASCO (Civil and Structural), J. A. Jones, and Fegles Power Services did not meet all the requirements of ANSI N45.2.6, "Qualification of Inspection, Examination, and Testing Personnel for Nuclear Power Plants."
A-111	Specifications and procedures used as acceptance criteria for concrete work were frequently ignored by J. A. Jones personnel.
A-112	J. A. Jones concrete placement packages were incomplete, inspectors were not certified to inspect concrete placements, placement packages indicated a failure to implement specifications and procedures, and records in the placement packages had been tampered with.
A-113	Based on information presented in an EBASCO memo on concrete placement records of December 9, 1982, a 100% review of the concrete placement records should have been started and the problems should have been identified on the NCRs. It is further alleged that some items which did not result in NCRs may contain deficiencies reportable to NRC Pursuant to 10 CFR 50.55(e).
A-114	Inadequate disposition of an NCR concerning clam shell filter blanket.
A-115	There were deficiencies in Cadweld splice tensile testing rates when compared with the requirements in the EBASCO Cadweld specification. It is also alleged that the closure of the NCR which identified these deficiencies may not be adequate.
A-116	Unauthorized changes and additions have been made to J. A. Jones concrete placement records by unknown personnel.
A-129	Installation inspection and acceptance of waterstop splicing activities were performed by J. A. Jones personnel who were not certified for these activities. Furthermore, the review of the waterstop QC documentation is incomplete and those records that were inspected showed failure to implement requirements of specification and procedures relative to testing frequency, recording of applicable information, and splice location.

Allegation Number(s)	Characterization
A-132	J. A. Jones did not use DNs or NCRs to report information that needed EBASCO QA review.
A-134	Existence of a file of letters ("Nasty Grams") which were prepared when it was not possible or acceptable to initiate an NCR.
A-136	It was difficult for EBASCO QA personnel to get approval to initiate a formal NCR between 1975 and 1977 in the civil-structural area.
A-138	Review of soils packages by QA Installation Review Group revelaed deficiencies in approximately the first four feet of backfill; work was stopped before completion.
A-139	A review of records for the concrete basemat indicates poor concrete placement practices during construction in violation of the specification and the American Concrete Institute standards, and that those poor placement practices led to the cracks found in 1983.
A-141	Original DNs from AQIRG review of 70 of 1200 concrete packages may not have been reviewed.
A-142	An NCR, initiated by an alleger, has been adequately dispositioned. No allegation is contained in this reference.
A-145	The location plots for some of the in-place density tests for soil backfill did not fall within the fill area that was identified on the test report.
A-146	Deficiencies in Cadweld splicing records identified in NCR W3-6234 have not been properly dispositioned.
A-147	Cadweld test reports were "created" to replace lost records on tensile test reports.
A-149	Four NCRs were signed by QC inspectors performing work prior to their being certified. One NCR shows a lack of inspection reports for installation of seismic Category I stairs.
A-156	J. A. Jones daily Cadweld inspection reports contained inspector's signatures or initials that were possibly forged.
A-158	In an internal EBASCO memo of June 9, 1983, concerns were raised regarding J. A. Jones QA/QC documentation.

Allegation Number(s)	Characterization
A-160	Support structures for instrumentation cabinets mounted on gratings inside the reactor containment building were fabricated with materials which lacked heat number traceability; weld rods used were not traceable; and welding was performed and inspected by unqualified and uncertified personnel.
A-168	Poor quality control by American Bridge (AB) resulted in a lack of traceability of 2300 pounds of non-safety weld rod which may have been used in safety-related structures.
A-169	An EBASCO engineer closed out an NCR concerning work done by American Bridge on steel beam connections without sufficient technical justification.
A-170	An EBASCO discrepancy notice was not properly dispositioned for missing reinforcing steel in the fuel handling building (FHB) and EBASCO may have lacked a procedure for upgrading engineering discrepancy notices (EDNs) to NCRs.
A-171	Impaired quality of Cadweld splicing due to EBASCO's practice of allowing the use of oversize Cadweld sleeves.
A-177	An EBASCO quality assurance (QA) inspector did not exercise proper judgement and may not have been doing his job honestly while dispositioning NCRs concerning American Bridge Company steel construction work.
A-182	Welding performed by J. A. Jones Construction Company on structural items, such as pipe hangers or supports for heating, ventilating and air conditioning systems, has not been inspected.
A-256	CB&I had problems with protective coatings and material traceability for the inside of the containment vessel.
A-258	CB&I did not maintain material traceability on certain Seismic Category I structural components in the containment vessel that were fabricated from Class D materials.

Allegation Number(s)	Characterization
A-259	CB&I used Class D material in the fabrication of certain nonpressure bearing structural components inside the containment building. This material was not welded with traceable weld rod and not traceable to a specific welder.
A-260	There is a lack of traceability of certain materials used in non-pressure retaining components in the containment vessel.
A-268	Surface-mounted base plates for instrument stands and tubing supports have not had grout placed beneath them by contractors to provide an adequate contact surface.
A-270	The concerns mentioned in a document called an "after-action report" written by an EBASCO QC civil engineer (dated December 15, 1975) on the common foundation basemat, Block No. 2 (placement sequence 3) have never been properly addressed or resolved.
A-271	Improper consideration was given to upgrading the process for cleaning and coating the interior of the containment vessel.
A-298	The EBASCO vendor reviews were inadequate and QC was not checking structural items for defects, such as shop welds by Peden Steel.
A-306e	Concerns a specific letter (File Reference W3-QAIRG-0420) enclosing NCR W3-5077 and the associated disposition noted for NRC staff review for adequacy of disposition.
A-319	EBASCO closed NCRs on instrumentation support weld deficiencies prior to protective coating application.
A-335	Documentation does not exist to verify that inspectors who signed concrete curing records for the reactor containment building dome and parapet wall were on site over weekends in order to implement procedures requiring that concrete being cured be monitored once a day for seven consecutive days.

Task: Allegation A-01

Characterization: It is alleged that the employment records for quality assurance (QA) personnel of the Mercury Construction Company have not been verified and that the implications of this alleged practice may apply to all Mercury employees.

Assessment of Allegation: The implied significance of this allegation is that unqualified Mercury quality control (QC) inspectors may have performed inspections on safety-related systems, making the validity of the inspections questionable and the quality of the work indeterminate.

The NRC staff reviewed Mercury's procedure for qualification of inspection, examination and test personnel, inspector certification records, and personnel training and resume packages against Regulatory Guide 1.58, Revision 1, as suggested by NRC Generic Letter 81-01, ANSI N45.2.6-1973, and IE Circular 80-22.

The NRC staff sampled 30% of the inspector certifications of QC personnel; the results revealed that no verification of past employment was documented. An additional staff examination of inspector qualification for Allegation A-02 has indicated a generic problem of improperly certified inspectors.

Mercury inspectors had performed inspections on safety-related systems. The NRC staff believes this allegation has implied safety significance.

Actions Required: See Item No. 1 in the enclosure to the letter from D. Eisenhut to J. M. Cain (LP&L), June 13, 1984.

Task: Allegations A-02, A-208, A-274

Characterization: The allegation is that QC inspectors from the Mercury Construction Company were not properly certified for their positions.

Assessment of Allegation: The implied significance of this allegation is that QC inspectors with the Mercury Construction Company may have been incorrectly certified because they lacked the required education and experience. The safety significance is that unqualified QC inspectors may have inspected safety-related systems, thereby rendering verification of the quality of these systems indeterminate.

The original licensing commitment for QC inspector qualifications by LP&L as stated in the PSAR was to the "green book;" ANSI N45.2.6, 1973. The NRC task force staff determined that LP&L's commitments, as required in NRC Generic Letter 81-01, are inadequate in that they have committed to ANSI N45.2.6, 1978, and Regulatory Guide 1.58, Revision 1, for Operations only. The commitment to these standards was never imposed by LP&L on the site contractors for the construction phase of Waterford Unit 3. It should be noted that the 1978 version of ANSI N45.2.6 is a less conservative standard, however, commitment to the 1978 standard and Regulatory Guide 1.58 would have made verification of resumes mandatory.

Due to the findings related to Mercury Company activities the scope of the review was expanded to other contractors.

This issue was addressed by reviews of the Mercury, Tompkins-Beckwith (T-B), and GEO Testing (ANST/TC-1A) QC inspection qualification procedures, ANSI N45.2.6, 1973, and the certification and resume packages.

NRC reviewed inspector certifications for 37 of the 100 Mercury QC inspectors, including certifications for all Level III personnel. Twelve inspector certifications were found questionable due to insufficient education or experience when compared to either the 1973 or 1978 versions of ANSI N45.2.6.

The certification records of 38 T-B QC inspectors were selected at random and reviewed. Fourteen inspector certifications were found questionable due to insufficient education or experience. The T-B certification procedure was determined to be inadequate when compared to ANSI N45.2.6, 1973.

The certification records of 40 GEO Construction Testing NDE inspectors also were selected at random and reviewed to GEO Procedures and ASNT/TC-1A. All were found to be acceptable.

This allegation has implied safety significance and is also indicative of a generic site problem for inspector certification. The full scope of the problem cannot be determined until assurance is provided that the equipment and systems have been inspected by qualified inspectors.

Actions Required: See Item No. 1 in the enclosure to the D. Eisenhut letter of June 13, 1984, to J. M. Cain (LP&L).

Task: Allegation A-03

Characterization: The allegation is that answers to Mercury Construction Company certification examinations for QA inspectors were given out prior to the tests.

Assessment of Allegation: The implied significance of this allegation is that Mercury personnel may have been certified incorrectly, based on fraudulent examinations, which could affect the acceptability of safety-related systems.

The NRC staff reviewed a sample of examinations given to Mercury QC inspectors, the Mercury procedures for certification of inspectors, and previous reviews of this item by LP&L and the NRC Senior Resident Inspector.

The examinations of the same inspectors used for the sample population of Allegation A-02 were reviewed for trends. No indications was found to support the allegation. The NRC staff found that although two examinations were graded incorrectly, in both cases the grade would have been passing anyway.

The NRC staff was unable to interview any previous Mercury QC inspectors; however, the NRC Senior Resident Inspector interviewed six Mercury QC inspectors at the time of the allegation. They all stated that they had not been given the answers prior to the examination.

The NRC staff believes this allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-04

Characterization: The allegation is that some Mercury QC inspections were signed off as being done but were not.

Assessment of Allegation: The implied significance of this allegation is that if inspections were not performed, installations would be questionable.

The NRC staff reviewed 10 operational control record (OCR) packages of approximately 60 instrument lines with at least 10 welds in each line (600 welds). Additionally, the staff performed a walkdown of 19 instrumentation installations and found no problems. The records reviewed by the NRC staff were complete and dates shown for performance of the inspections appeared feasible. Also see Allegations A-183a and A-184.

The NRC staff concludes that this allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-05

Characterization: It is alleged that EBASCO quality assurance (QA) personnel used speed letters instead of deficiency notices (DNs) to identify problems on system turnover documentation packages.

Assessment of Allegation: The implied significance of this allegation is that, because speed letters are an unauthorized corrective action system, QA corrective action and nonconformance control systems may have been circumvented. Speed letters do not provide for accurate identification of deficiencies or discrepancies, and do not assure that corrective action has been taken regarding safety-related systems.

The NRC staff reviewed EBASCO QA procedures for system turnover to determine if the procedures provided for accurate records review to assure proper identification of nonconformances. The staff also noted whether or not the procedures allowed the use of speed letters, and whether or not corrective action documents were generated based on the contents of the speed letters.

The NRC staff reviewed EBASCO Quality Assurance Instruction (QAI)-9 and compared it to applicable ANSI 45.2 standards and 10 CFR 50 requirements. The staff found QAI-9 to be acceptable. QAI-9 provided guidelines for the collection, handling, and review of construction and installation QA records and for transmittal to the EBASCO QA Records Supervisor for storage, handling, and maintenance. QAI-9 also provided instructions for describing the review status of construction and installation records. Quality assurance records reviewers were required to review packages for completeness, accuracy of content, proper form, traceability, legibility, authenticity, and proper changes and supplements. Any deficiencies noted on the documentation were to be corrected, or, if unable to be resolved prior to submittal for turnover, they were to be documented on Form QAI-9.2. As a part of the review status, a separate recommendation was to be made on the form to identify potential deficiencies affecting hardware.

The NRC staff found that EBASCO QA procedures did not address the use of speed letters as an alternative for identifying deficiencies or discrepancies. However, the staff did determine that speed letters were used to request information regarding engineering problems, to obtain engineering evaluations, and to question the disposition or closure of deficiencies, and that they were also used by the EBASCO Quality Assurance Installation Review Group (QAIRG) to identify problems noted on the authorized QAI-9.2 forms. The speed letters transmitting this information were then forwarded to lead coordinators who resolved or provided dispositioning instructions to the reviewer.

The NRC staff reviewed the QAI-9.2 forms of 68 documentation packages and determined that the information noted in the EBASCO speed letters referenced previously identified problems stated on the QAI-9.2 forms. The staff found that corrective action documents, QAI-9.2 forms, NCRs, and DNs were generated as a result of these reviews.

However, during the NRC staff's review, several deficiencies were noted regarding item resolution or non-resolution. The staff believes that, due to the nature of the deficiencies, an NCR should have been written for:

- Q2-CS-1C-27 - 9.2 Reviewed Item 63 - Inadequate documentation; should have been elevated to an NCR.

- Q2/3-FW/1C-8510 -9.2 Reviewed Items 18, 19, 20; Q1-RC-1C-674 - 9.2 Reviewed Item 13.

  (1) Improper Closure Reference TBP-35; to be revised to correct deficiencies on February 15, 1983; latest revision of TBP-35 was June 18, 1982. An NCR should have been issued. (2) Removal of QC checkpoint was by improper authority.

- Q2-SI-1C-89 - 9.2 Reviewed Item 17 - Incorrect/inadequate documentation; should have been elevated to an NCR.

- QMC-APO-P47E - 9.2 Reviewed Item 26 - Closed DR with another DR, instead of an NCR. Penetrant test acceptance dates preceded the test request (prior to completion of the report). Both issues warranted an NCR.

- BD-1C-1143 - Traceability was required to warehouse only and not to the point of installation. Heat numbers were used interchangeably. Should have been upgraded to an NCR.

- Q1-RC-LWS-RC-2 - Same as Q2/3-FW/1C-8510.

- LW3-RC-29 - 9.2 Reviewed Item 11 - Flange retorqued but gasket installation was indeterminate. An NCR should have been issued.

- Q2-LW3-SI-10 F/E - 9.2 Reviewed Item 11 - Additional data added to a CMTR; procedural violation. An NCR should have been issued.

- CH-1C-342 - 9.2 Reviewed Items 19 and 25. Same as Q2/3-FW/1C-8510.

- CC-1C-6 - 9.2 Reviewed Item 1 - A DN was issued but did not relate to DR subject denoted. Flange was retorqued May 11, 1984. Potential Generic Issue - Use of 0-600 ft-lbs torque wrench for 90 ft-lbs when not calibrated at low range. (Identified as generic problem in DN T-B W-6531.) Resolution was "use as is" since the bolts are evenly torqued, but resolution did not address problem of torque wrench. Generic problem for all 9.2 reviews that closed out deficiencies referencing this DN.

  Conflicting guidance with the above; FCR MP382 and IR 07012 (T-B) state "torque to machine bolt specifications as opposed to evenly torqued."

- AQMC-SI-P39-E - 9.2 Reviewed Item 10 - DN was written, but should have been an NCR.

- QMC-HYPO-P11-E - 9.2 Reviewed Items 43, 78, 81 - Inspection and documentation required by problem CIWA were not performed in accordance with procedures; an NCR should have been written.

The NRC staff found no indications that the use of speed letters did circumvent the corrective action and nonconformance control systems. EBASCO's QA records review procedures were in accordance with applicable standards of ANSI N45.2

and the requirements of 10 CFR 50. The staff also believes that QAI 9.2 forms (DRs) were acceptable to use for identifying potential problems with safety-related systems.

However, as noted previously, other discrepancies exist in the QA documentation packages reviewed by the NRC staff and, although reported on QAI 9.2 forms, these discrepancies required further corrective action by LP&L.

Actions Required: See Item No. 6 in the enclosure to the D. Eisenhut letter of June 13, 1984 to J. M. Cain (LP&L).

Task: Allegation A-06

Characterization: The allegation is that EBASCO Quality Assurance (QA) reviewers have not completed on-the-job training (OJT) requirements.

Assessment of Allegation: The implied significance is that without adequate QA indoctrination and OJT, the record reviewers may not be properly performing their jobs.

The NRC staff reviewed EBASCO training requirements, records, and work products and held discussions with the EBASCO training coordinator and QA personnel. The NRC staff found that records reviewers are required by EBASCO to have a minimum of from 40 to 80 hours of OJT depending on their previous experience, a high school level education, classroom training, and QA reading assignments.

There are no specific training qualification or certification requirements for document reviewers in NRC regulations, the ASME Code, or ANSI Standards. The NRC staff finds the EBASCO QA training program adequate.

The NRC staff reviewed a sample of 40 training files of QA record reviewers and found them to be in compliance with EBASCO training requirements. The staff also reviewed a sample of work performed by QA records reviewers and determined it to be satisfactory.

EBASCO had addressed the problem of incomplete OJT QA records for record reviewers with an EBASCO audit in October 1983. Subsequent EBASCO action updated and completed those records, and the subject audit was closed in January 1984. The NRC staff has reviewed those audit files and concurs with the disposition, action, and closure.

The NRC staff noted that OJT requirements for QA record reviewers were not properly documented at the time of the allegation in August 1983; however, corrective action has been taken by EBASCO. The NRC staff has verified that EBASCO QA records were properly corrected, and that work performed by QA record reviewers was satisfactory.

Actions Required: None.

Task: Allegations A-07; A-29

Characterization: The allegation is that EBASCO quality assurance (QA) reviewers are "grooming" paperwork; e.g., having individuals sign documents years after the fact, and not back-dating to indicate a late entry, and that alterations in QA documentation are unauthorized, with no substantiating indications for changes.

Assessment of Allegation: The implied significance of this allegation is that records of safety-related systems may be inadequate.

The NRC staff evaluated EBASCO's QA records review system and the qualifications of record reviewers. Also a sample of QA records was reviewed specifically for unauthorized changes, dates out of sequence, white-out, incorrect data, or appearance of falsification.

The NRC staff found that EBASCO procedures provided guidelines for changes or corrections to documents. Documents were reviewed prior to submittal to record storage. EBASCO records reviewers were trained and qualified, and although problems in training had been encountered, those problems had been corrected.

The NRC staff extensively reviewed documents submitted by various contractors and originally reviewed by EBASCO. One possible falsification of a signature on a nonconformance report (NCR) was observed. Otherwise, no deliberate or obvious falsification of records was noted.

The NRC staff considers the EBASCO records review system and qualifications of record reviewers adequate (see allegation A-06 and A-196). This allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-08; A-183b

Characterization: The allegation is that quality assurance (QA) documents were not stored in fire safes overnight and that some records were being stored in a warehouse in old file cabinets and boxes.

Assessment of Allegation: The implied significance of this allegation is that improperly stored records could be lost, misplaced, or destroyed due to fire, causing the required documentation to be irretrievable and the validity of installation and inspection to be indeterminate.

The NRC staff reviewed EBASCO's QA records storage practices against the requirements of ANSI N45.2.9., and found them to be adequate. The records stored in the warehouse were found to be duplicates.

Quality records and their protective storage are addressed in ANSI N45.2.9. Incompleted QA records do not fall under the definition of "valid records" as stated in ANSI N45.2.9. As defined in Section 1.4 of ANSI N45.2.9, a QA record exists when it has been completed; as defined by Section 3.2.1, "documents shall be considered valid records only if stamped, or initialed, or signed and dated by authorized personnel or otherwise authenticated. These records may be originals or reproduced copies."

In conclusion, the NRC staff review did not find any indications of completed QA records left out of the required storage areas. This allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-09

Characterization: The allegation is that contractor quality assurance people doing document reviews are being laid off and EBASCO engineers are being moved into quality assurance positions.

Assessment of Allegation: The implied significance of the allegation is that without adequate quality assurance indoctrination and training the EBASCO engineers performing record reviews may not effectively perform their assignments.

This issue was addressed by reviewing training requirements, records, and work products. In addition, interviews were conducted with the EBASCO training coordinator and other key personnel.

The NRC staff found that record reviewers were required by an EBASCO procedure to have the minimum of a high school diploma, QA indoctrination consisting of lecture and reading assignments, and on-the-job training (OJT). For example, two electrical engineers originally from EBASCO's New York office, completed the QA indoctrination and reading phase of their training and one completed OJT on January 16, 1983. The other did not complete the OJT portion of the training and was transferred to the electrical engineering group onsite. He had never performed document reviews. The other individual performed mechanical, instrumentation and control document reviews until he terminated his employment with EBASCO on March 15, 1984. Consequently, the NRC staff made the determination that the individual had not inspected any work for which he had engineering responsibility.

There are no specific training qualification or certification requirements for document reviewers in NRC regulations, the ASME Code, or ANSI Standards, and the EBASCO training program appears to be adequate.

NRC found no indications that QA document reviewers under contract were laid off for any reason, other than financial, in that EBASCO already had engineers like the two discussed on their payroll. Consequently, this allegation has no safety significance and is not indicative of any generic implications or management problems.

Actions Required: None.

Task: Allegation A-13, A-14, A-15, A-16, and A-17

Characterization: It is alleged that seismic supports for cable trays had documentation deficiencies identified by EBASCO Quality Assurance Installation Review Group (QAIRG) which were not being addressed.

Assessment of Allegation: The implied significance of the five separate allegations in this area is that lack of corrective action on identified deficiencies could cause the quality of installation to be questionable.

These five allegations involved specific problems with documentation of cable tray supports. The NRC staff evaluated each of the allegations for adequacy of documentation; and the staff inspected each installed support.

LP&L had responded to each of the allegations in two submittals to the NRC Senior Resident Inspector (SRI). Their responses explained why they did not consider some of the allegations to be a problem, or if problems were evident, what corrective actions they were taking. The NRC staff reviewed LP&L's responses and considered them to be adequate.

In assessing these allegations, the NRC staff verified that the documentation for each support matched each installed support inspected by the staff. The following is an itemized explanation of each allegation:

Allegation A-13 involved defaced documents and inaccurate references to design documentation. The allegation was brought to the attention of the NRC staff on October 7, 1983; however, on September 15, 1983, EBASCO NCR W3-6938 had been issued to document these concerns. EBASCO had reinspected the supports on October 12, 1983, and had closed the NCR on October 28, 1983. The NRC staff reviewed the documentation and inspected the supports, and determined that this nonconformance had been properly resolved.

Allegation A-14 was related to a support which contained three 3/8" concrete anchors instead of only two as indicated on the inspection documentation. LP&L agreed that a question existed, and they reinspected the hanger. Their reinspection revealed no deficiencies (Daily Surveillance Report W3-NY-12 TK-7, Feburary 28, 1984). The NRC staff reviewed the reinspection records, performed a field inspection of the support, and determined that this problem had been properly corrected.

Allegation A-15 involved a question of whether a support had been deleted, replaced, or remained, due to "confusing" information on inspection documentation. The NRC staff reviewed the subject documentation, performed field inspections, and determined that the support had been deleted and was replaced by a new support. The new support was inspected by the NRC staff and was found acceptable.

Allegation A-16 involved a missing concrete anchor inspection form in the documentation package for support 32J13. EBASCO had issued NCR W3-7310 on October 19, 1983, to document this deficiency. The NRC staff reviewed the closure of this NCR and found that it had been properly dispositioned and closed.

Allegation A-17 involved a question as to whether support 22E40 still existed in the field, due to a "confusing" hanger identification number in the documentation package (22E40/C100), and involved a concrete anchor inspection report which referenced this support, although the support contained no concrete anchors. The NRC staff review of this allegation revealed the following:

- The "C100" in the hanger identification number was the batch number of the paint used to coat the support. The staff determined that no conflict in hanger identification existed.

- The anchor inspection report in question (303-87-87) had been revised on October 10, 1983, to indicate that the correct support identification number was 24E40, not 22E40. This correction of the report was considered appropriate. In addition, support 24E40 had since been deleted; therefore inspection report 303-87-87 no longer pertained to any existing installation and was removed from the records vault. The NRC staff considered this action to be appropriate.

The NRC staff determined that EBASCO QAIRG adequately addressed and corrected seismic support documentation deficiencies. These allegations had neither safety significance nor generic implications.

Actions Required: None.

Task: Allegations A-18 and A-164

Characterization: It is alleged that, due to EBASCO's inadequate nonconformance control, six nonconformance reports (NCRs) were found with no numbers; e.g., not included in the NCR system.

Assessment of Allegation: The implied significance is that improper use of the NCR system could lead to inadequate reporting, nonconformance identification, timely corrective action, trending, reportability review, and correction of nonconforming conditions. This could render the quality of installed safety-related systems as being questionable.

The NRC staff evaluated EBASCO's procedures for processing nonconformances to determine the control maintained and the methods used to generate NCRs. The staff also reviewed other, similar allegations and attempted to determine which unnumbered NCRs were not entered into the system. Regarding the unnumbered NCRs, the NRC staff attempted to determine if they had been entered into the system and if they had been properly dispositioned and closed. Also see Allegation A-53.

The allegation referred to six missing EBASCO NCRs without numbers (and not in the NCR system): These NCRs were related to Fischbach & Moore tension test problems related to expansion anchors. However, the NRC staff found seven unnumbered NCRs; the staff relayed this information to LP&L for their action, and on February 15, 1984, LP&L provided a response, which stated that the original six nonconformance conditions had been addressed on EBASCO NCR W3-7533. The NRC staff review of LP&L's response disclosed that only four of the seven unnumbered NCRs were actually captured in W3-7533; the three missing NCRs were found to have been previously documented on EBASCO NCRs W3-7183, W3-7179, and W3-7561. LP&L also informed the NRC staff that additional problems with tension testing had been entered as EBASCO NCRs W3-7184, W3-7182, W3-7180, W3-7140, W3-7138, W3-7177, and W3-7139. The NRC staff reviewed the status of all of these NCRs and found them closed except for W3-7533, W3-7179, and W3-7140 (see Allegation A-33).

Additionally, the NRC staff looked for other missing EBASCO NCRs and found that the following "voided" (missing) NCRs were not in the card index or in the QA vault: W3-27, W3-814, W3-859, W3-981, W3-1053, W3-1102, W3-1109, W3-1228, W3-1349, and W3-1438. The staff discovered that NCR W3-1215 was in the QA vault but was not in the NCR card index file.

Overall the NRC staff's review disclosed that there were open NCRs with incomplete corrective action, which could result in unacceptable performance of safety-related systems. The staff could not review missing, "voided" NCRs; therefore, questions remain concerning acceptability of installed safety systems, and the safety significance of this allegation could not be determined. The NRC staff believes this allegation has generic implications; as stated herein problems were identified with EBASCO and Fischbach & Moore.

Actions Required: See Item No. 13 of the enclosure to the letter from D. Eisenhut to J. M. Cain (LP&L), June 13, 1984.

Task: Allegation A-19

Characterization: It is alleged that record deficiencies existed for 186 separate Fischbach & Moore (F&M) documents.

Assessment of Allegation: The implied significance of this allegation is that record deficiencies may not have been properly identified and processed in the required nonconformance system and that they may have affected hardware installation.

The 186 documents identified 192 separate "issues" requiring investigation. In assessing the allegation the NRC staff divided the "issues" into the following seven general categories:

(1) 75 of the issues pertained to inspection checklists containing handwritten notes to the effect that the actual quantity of field-run supports attached to a specific engineered support needs to be verified. This concern was identified as a generic problem during the NRC construction appraisal team (CAT) inspection and will be tracked during CAT follow-up inspections.

(2) 12 of the issues pertained to inspection checklists which had not been signed by the Quality Control (QC) Engineer in the space provided. A review of the procedures in effect at the time revealed that the QC Engineer's signature was not required provided that the QC Supervisor's signature appeared in the space provided for him. The procedure sections which clarified this are QCP-305, Revision 4; November 20, 1980, Section 6.4 and QAP-201W3, Revision 2, January 26, 1981, Section 5.3.1.C. The NRC staff review revealed the inspection checklists missing the signature of the QC Engineer were in fact signed by the QC Supervisor.

(3) 29 of the issues pertained to documents with handwritten references to a "Dead File" or a "Duplicate File." In conversations with a former F&M records clerk, the NRC staff learned that if two or more duplicate records were generated for the same item or activity, only one was maintained as the official record. The others were placed in a file referred to as either a "Dead File," a "Historical File," or a "Duplicate File." This "Dead File" is now located in F&M's Dallas office. The staff compared 13 of these "Dead File" records with the official records in LP&L's records facility and determined that the official records provide adequate documentation for the installation or activity involved.

(4) 5 of the issues pertained to various documentation problems for electrical supports that were not adequately addressed. The NRC staff brought these items to LP&L's attention, whereupon they issued LP&L Site Surveillance Report W3S-84-16S to initiate appropriate corrective action. Items 1 through 4 on the site surveillance report encompassed these 5 issues.

(5) One issue duplicated Allegation A-13 and is discussed in the assessment of that allegation.

(6) 67 of the issues were listed for which the NRC staff either could not determine the nature of the concern or determined that the concern had been adequately addressed during its normal review cycle.

(7) Three of the issues duplicated other issues.

The NRC staff concludes that this allegation has neither safety significance nor generic implications.

Actions Required: LP&L shall resolve the issues raised in LP^L Site Surveillance Report W3S-84-16S.

Task: Allegation A-20; A-21; A-22

Characterization: It is alleged that there were nine general areas of concern, thirty-six specific recordkeeping problems related to penetrations 38 (A-20) and 65 (A-21) (A-22), and similar recordkeeping problems with eight other penetrations. These problems included improper drawing changes, incorrect identification of some heat codes and welds, and improperly altered dates for some welds.

Assessment of Allegation: The nine general areas of concern were stated very generally , such as: Structural welding and bolting problems, hanger deficiencies, improper as-built drawings, and alteration of quality assurance (QA) documentation.

The allegation did not provide sufficient, specific details to the NRC staff to allow further review. Other more specific allegations which related to the concerns in this allegation have been reviewed and assessed by the NRC staff. As a result, no further review was made of the nine areas of general concern.

The NRC staff reviewed 20 of the 36 recordkeeping problems related to penetrations 38 and 65, and found they had been corrected by Tompkins-Beckwith (T-B). A similar situation was found after the NRC staff reviewed one of the eight penetration documentation packages.

The NRC staff found that, prior to acceptance of the completed T-B records package, EBASCO had prepared closure of a document describing the deficiencies and corrective measures. The document listed all items to be reviewed and resolved by T-B before EBASCO would accept the package. This allegation was apparently based on language in the document before T-B had the opportunity to review the document and correct the deficiencies. The NRC staff found that T-B adequately completed the documentation packages for transfer to EBASCO. Although all the information needed to understand the work performed and to trace the material used was available within the packages, the data could have been arranged in a more orderly fashion.

Minor revisions to some records will be necessary to bring the records into full compliance with established procedures.

Traveler documents examined during the resolving of other allegations were found to be in the same condition indicating a generic problem.

The NRC staff did not find that the condition of the record packages would have an effect on the safety of the plant.

The NRC staff concluded that although the allegation does not have safety significance it does have generic implications.

Actions Required: As an example, prior to 5% power, LP&L shall provide to the NRC staff, a plan outlining a proposed program to resolve the generic problem of document revision to incorporate final assembled information and revise the traveler documents. LP&L shall revise Weld Control Record Sheet 6, Revision 1, as indicated in the response to Allegation No. 6 of Penetration 38 of this enclosure.

A-20 ENCLOSURE

Allegation Evaluation of Penetrations 38 and 65

A number of penetrations were furnished by the metal containment installer which extend through the containment steel wall and concrete wall.

The NRC staff reviewed penetrations 38 and 65, as shown in penetration drawings. As indicated in the drawings, there is a weld (FW1) between the pipe enclosure and the containment steel wall penetration, as well as two attachment welds (FW2 and FW3) at the support ring which connects the bellows expansion assembly to the end of the metal sleeve through the concrete wall. Other penetration items are also attached by welding in the field.

I. Penetration 38

Record Package (Traveler) No. QMC-SI-P38
Isometric drawing (ISO) No. D-22949

1. Allegation

Sheet 2, Revision 4, of the isometric drawing has details that have been improperly erased/deleted.

Response

The details referred to in the allegation are the result of the addition and then deletion of two couplings and nipples for the bellows test connection.

FCR MP-1736 added the items as shown in Redline P500 on the isometric drawing. FCR MP-2342 deleted the couplings and nipples. The removal of the fittings resulted in ISO drawing D22949, Revision 4.

The drawing does not appear to be altered other than to accomplish the revision change.

No further action is required.

2. Allegation

Bill of Material Sheet 3, Revision 4, Item 3, S5 has an incorrect heat number entered. "BP" is a material manufacturer's initial for Bergen-Patterson and not a heat code or number. Also, Sheet 3, Revision 1, lists a different heat number for this same item - 810056. The heat log indicates this to be a PVN Steels Inc. (PVN) heat number. Other information in the related hanger traveler (SIRR-1246) indicates the material used was provided by BP and not PVN as indicated by Revision 1 of the Bill of Material (BM). Also the correct BP heat number is 26931. From the above information it is not clear which material was used.

Response

The allegation claims that an incorrect heat number "BP" is entered for Item 3 on BM Sheet 3, Revision 4. This heat identification has been removed from the BM and the space is now blank. This was done without revising the BM. Further investigation reveals that Item 3 was cut at the job site from a plate furnished by PVN.

Drawing SIRR-1246, Revision 2, Line 1 has the referencing heat number 810056, which is also shown on the PVN Certificate of Compliance dated March 2, 1981. Item 1 was shown on BP drawing SIRR-1246, Revision 2, but was not furnished by them.

No further action is required.

3. Allegation

BM Sheet 3, Revision 4, Item 4 also has "BP" listed as a heat number. This is incorrect, and the correct heat number, per a copy of Certified Material Test Record (CMTR) found in package, is F91512.

Response

Item 4 shown on BM Sheet 3, Revision 4 was furnished by BP as shown on their CMTR, Sheet 4 of 10, dated February 15, 1980. The heat number is F91512. Because the fabricated material was furnished by a subcontractor the heat number need not appear on the BM as long as it is shown on the CMTR. "BP" is no longer shown on the Item 4 line of BM Sheet 3. This space is empty. It was apparently removed without revising the BM.

4. Allegation

BM Sheet 3, Revision 4, Item 5 has missing heat numbers.

Response

Revision 4 of the BM now shows a heat number of "UR" for Item 5. The material test report from Gulf Alloy, dated August 20, 1982, lists the item and the heat number. The heat number was apparently added to the BM without revising the BM. The use of "UR" as a heat number should be addressed.

5. Allegation

Weld Record Sheet 6, Revision 0, Category "2/MC" (metal containment weld) is incorrect. FW3 weld is an AWS D1.1 weld, which is a tube track weld.

Response

The penetrations are a part of ASME code class MC and are correctly identified. Revision 1 to the weld record added welds FW4, FW5, FW6, and W7 which are safety category class 2 welds. The category shown on the weld record is correct.

The Weld Control Sheet 6, Revision 1, "Remarks Column," shows B31.1 as the governing welding piping code for welds FW2 and FW3. Although the FW2 weld is a D1.1 weld, both were done to Welding Procedure 1.4, which is a B31.1 procedure.

During the review for the preparation of the ASME N5 form on April 6, 1983, the "Remarks Column" was changed to show that both welds were to AWS D1.1, which is incorrect. The sheet should be revised to show the original B31.1 as the applicable code.

6. Allegation

On Sheet 6, Revision 1 of the weld record, welds FW4, FW5, FW6, and FW7 are shown as having filler material ER-303 using Weld Procedure 8.1. The rod withdrawal slip, however, shows E-308-16 filler material was used. The weld record was never changed to reflect the different filler metal.

Response

The statement made by the alleger appears to be correct. There is a discrepancy between the type of filler material used on welds FW4, FW5, FW6, and FW7, as shown on the weld control record and the T-B Electrode Requisitions 129350, 115187, 108881, 108856, and 108857.

The column "Filler Metal-Type" on Weld Control Record Sheet 6, Revision 1 should be revised to read:

FW4	E-308/E-308-16
FW5	E-308/E308-16
FW6	E-308-16
FW7	E-308-16

Either process is acceptable.

7. Allegation

Weld Record Sheet 6, Revision 1, welds FW6 and FW7. The weld record contains "writeovers" on the fitup dates for FW6 and FW7, indicating that the fitup dates have been altered without proper authority or procedure.

Response

The fitup dates for welds FW6 and FW7 appear to be written over. The final visual inspection for both welds is shown as the next day and these dates are in their original form.

The ANI reviewed the sheet during the N5 review and initialed the dates.

No further action is necessary.

8. Allegation

Weld Record Sheet 6, Revision 0. The line under remarks incorrectly lists the procedure as B31.1; it should be AWS D1.1.

Response

See response to Allegation 5.

9. Allegation

The Traveler Erection Sheet 7 (records for identifying field assembling operations), Revision 2 is missing the authorized nuclear inspector (ANI) signature from ANI-established hold points on Erection Sheet Items 9 and 10.

Response

It was not necessary to sign off either line until work was completed. ANI initials were added to the sheet during the N5 review.

10. Allegation

The code data report is incomplete, no reference was made to the attachment ring, and this item also needs a CMTR.

Response

The attachment ring was purchased from Associated Piping & Engineering Corporation. Along with the bellows penetration, reference is made to the CMTR through Associated Piping Production Traveler as item No. CR150. The CMTR for this item is in Associated Piping's supplier's package. The welding of the ring should be addressed in regard to the data report.

II. PENETRATION 65

1. Allegation

ISO DWG Sheet 2, Rev. 2 now has "Red-Lined" information added which is not covered by the latest Tompkins-Beckwith (T-B) and EBASCO revision stamps. This drawing should be marked "As-Built" not "Per Design" as presently marked.

Response

ISO DWG D-2299 is currently marked "As-Built," as approved by EBASCO Site Structural Engineer (ESSE) April 20, 1983. The red lined items 1, 2, and 3 were added per Field Change Request (FRC) No. FCR-MP1736 Rev. 0 and Rev. 1. No further action is required.

2. Allegation

The ISO Drawing bill of material is incomplete. See items 3, 9, and 10 on the traveler bill of material.

Response

Item 3 was added through FCR-MP292.
Item 9 was added through FCR-MP1944.
Item 10 was added through FCR-MP1944.

All three items are shown on BM Sheet 4A Rev. 1. No further action is required.

3. Allegation

ISO DWG Sheet 2, Rev. 5 indicates SA376 material was used for test connection pipes instead of SA312 called for on FCR-1736R1.

Response

EBASCO interoffice correspondence, dated April 6, 1983, indicates acceptability of substituting SA376 for SA312 on pipe.

The allegation has been corrected on Sheet 4A Rev. 1. See Allegation No. 4 above. No further action is required.

4. Allegation

The Weld ID sheet shows incorrect type of penetration for this package. This is a type II penetration.

Response

Weld ID Sheet 4 Rev. 1 is used for identifying welds FW2 and FW3. The penetration configuration shown on this sheet is incorrect. Sheet 4A Rev. 1 now shows the correct penetration. No further action is required.

5. Allegation

Sheet 4, Rev. 1 - FW1. Weld ID Sheet shows an incorrect FW1 weld to be located on the process pipe. It is actually located on guard pipe per design drawings.

Response

The allegation has been corrected on Sheet 4A, Revision 1. See Allegation No. 4 above.

6. Allegation

NCR W3-2980 for filler metal heat #065150 and NCR W3-5721 should be listed on the package NCR index.

Response

Both NCRs were entered as closed on Erection Traveler Sheet 8, Rev. 1, which was signed by the ANI 4/27/83. No further action is required.

7. Allegation

Heat numbers are needed for 1/4" caps-threaded listed as Item 6 BM Sheet 3, Rev. 5.

Response

The BM now shows the heat number for the caps to be UR. The use of "UR" as a heat number should be addressed.

8. Allegation

BM Sheet 3, Rev. 5. Items 9 and 10 have heat numbers missing.

Response

The following heat numbers were added to the BM without revision. Item 9 was purchased from Standard Pipe and Supply. BM Sheet 3 Rev. 5 indicates heat #M2747. Item 10 lugs were cut from a plate furnished by PVN. The heat number shown on BM is #12746. No further action is required.

9. Allegation

Weld Control Sheet 6, Rev. 0 weld FW3 has a missing filler metal heat number.

Response

Weld electrode requisition sheets 15133 and 14648 indicate the filler metal heat numbers used in welding FW3 as noted on Weld Control Sheet 6, Rev. 0. No further action is required.

10. Allegation

Weld Control Sheet 6 Rev. 0 lists the incorrect procedure. The procedure should be D1.1 rather than D31.1.

Response

Although FW3 weld is a D1.1 weld both FW2 and FW3 welds were done to Welding Procedure 1.4, which is a B31.1 Procedure. No further action is required.

Task: Allegation A-23a

Characterization: The allegation is that there are problems involving the Fischbach & Moore (F&M) installation, removal, and rework of conduit fire seals for electrical penetrations.

Assessment of Allegation: The implied significance of this allegation is that missing or improperly installed fire seals could allow propagation of a fire that could affect safe shutdown of the plant.

These problems were identified in or about October 1983 by LP&L Construction Quality Assurance (QA). As part of the solution to these problems, a number of corrective actions were initiated. A Stop Work Order (SWO) was initiated on October 21, 1983. The required corrective action included retraining construction personnel (particularly in the use of the applicable procedures), and reinspecting all safety-related sealed penetrations or conduits to determine if removal status was identified.

The SWO was lifted on October 24, 1983, based on completion of training and a commitment by F&M to develop a reinspection program for penetration seals. As a result, a program was initiated to address reinspection. Initially this program was to include only tray penetrations. Subsequently, the program was revised to include conduit seals. Specifically, EBASCO committed to perform a 100% walkdown inspection of conduit seals by plant area in conjunction with the area transfer program.

The NRC staff sampled the area transfer packages and confirmed that the seals were being properly reinspected and repaired or replaced when necessary.

Based on its review of the identified problems and subsequent actions, the NRC staff concluded that adequate corrective actions were implemented. This allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-23b

Characterization: It is alleged that the piping installation procedures of Tompkins-Beckwith, Inc. (T-B) did not contain provisions to assure that supports and hangers were maintained in the design-verified condition, and that as a consequence, hanger removals or modifications may have been made without conformance to an approved procedure. It is also alleged that T-B audits were not planned.

Assessment of Allegation: In evaluating this allegation, the NRC staff reviewed applicable documents and inspected samples of piping installations. Piping systems involved included ASME Code Classes 1, 2, and 3, which are all seismic Category I systems.

In May 1982, LP&L piping system audit reports identified discrepancies between actual hanger installations and design requirements. As a result, LP&L issued Nonconformance Report (NCR) W3-4010 on June 28, 1982, and Potentially Reportable Deficiency (PRD) 84 on July 1, 1982, notifying NRC on July 1, 1982. On August 2, 1982, PRD 84 was final-evaluated and upgraded to Significant Construction Deficiency (SCD) 60, and NRC was so notified. Interim reports have been submitted by LP&L to NRC, apprising them of progress leading to a planned closeout of the issue in the second quarter of 1984.

NRC Inspection Report 50-382/82-14 (December 6, 1982) identified the deficiencies involving SCD 60 as representing a partial breakdown in LP&L's quality assurance (QA) program as it relates to QA/QC reviews of T-B supports and hangers by EBASCO and T-B QA/QC. The NRC subsequently issued a civil penalty related to this issue.

LP&L took prompt and extensive action to identify and correct these problems. Key steps in LP&L's corrective actions include:

1. Training T-B hanger engineering personnel.

2. Training T-B QC inspectors.

3. Having T-B QC and Engineering reinspect 4,400± hangers installed prior to July 6, 1982.

4. Having T-B QA audit reinspections and inspections.

5. Having T-B document deficiencies under NCR W3-4010.

6. Training EBASCO QA support and restraint documentation package reviewers.

7. Having T-B, with EBASCO support, review documentation packages prior to submittal to EBASCO.

8. Having EBASCO QA review and approve documentation packages prior to transferring them to LP&L.

9. Having LP&L QA review documentation packages.

With the identification of discrepancies between as-built piping hanger conditions and the associated design drawings, LP&L instituted a corrective action program. The NRC staff believes that the allegation may have been based on the limited knowledge available to the alleger at the time of the 1982 LP&L audit of piping documentation packages.

LP&L has taken corrective action to close out identified discrepancies associated with the allegation.

Requirements for and accomplishment of LP&L audits were reviewed by the NRC staff, LP&L, EBASCO, and T-B. QA manuals and their implementing procedures for each of these organizations have continually required the performance of scheduled and unannounced audits since the commencement of their Waterford activities. Both onsite and offsite audit teams have been utilized over the years to perform the required audits of QA programmatic and hardware-oriented requirements. The implementation of audit programs at the Waterford Site is addressed in Allegation A-48.

This issue has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-23c

Characterization: It is alleged that Tompkins-Beckwith (T-B) welding procedures and techniques used in ASME Code Classes 1, 2, and 3 piping systems installed by T-B were inadequate in six specific areas.

Assessment of Allegation: The NRC staff assessed this allegation based on the ASME Code requirement that before certain welds are used in a nuclear plant, a typical sample must be produced and tested. The sample must be of identical material and must simulate the same welding conditions as those expected in the field.

The first area of the alleger's concern is that T-B welding procedure (WP) 1.8 did not include qualifications for weld impact tests (Charpy impact tests) and for post weld heat treatment (PWHT). This procedure was used on penetrations and, if the allegation is true, the quality of penetrations could be questioned.

A test or welding operation is considered qualified in a procedure when that test or operation is shown to be capable of producing the desired results. If, for example, a weld procedure includes qualifications for Charpy Impact Tests, then Charpy impact tests must be performed in accordance with certain criteria specified in the procedure. The Charpy Test is a measurement of the toughness of the weld and associated base metal.

Contrary to the statement in the first allegation, T-B WP 1.8 is qualified for impact testing by association with WP 1.15. The first portion of WP 1.15 is identical to WP 1.8. The ASME Code allows a successful qualification to be equally applicable to all identical welds. The successful qualification of WP 1.15 therefore also qualified WP 1.8.

WP 1.8 was also used in conjunction with T-B WP 1.14. A post-weld heat treatment (PWHT) was performed to meet WP 1.14 weld requirements. As a result, WP 1.8 was qualified for impact tests and PWHT so that this area has neither safety significance nor generic implications.

The second and third areas of the alleger's concerns were closely related and can be discussed together. The second concern is that T-B procedure TBP-6 requires welding procedure specifications to be qualified to subsections NB, NC, and ND of the ASME Section III Code. It is alleged that the welding procedures are qualified only to subsection NE of the Code and that the procedure may not even meet this requirement. The T-B welding procedure numbers involved are: 1.1 through 1.7. It is also alleged that "procedures" for impact testing are not qualified per Code Requirements.

The third concern is that some T-B welding procedures do not meet the impact testing requirements of the ASME Section III Code.

Weld procedures can be separated into those requiring Charpy impact testing and those that do not. Code requirements prohibit using procedures without Charpy impact tests on certain welds. The alleger based his concern on whether certain weld procedures (WP 1.1 - WP 1.7), which did not include impact testing, were used on welds requiring impact testing. The allegation was based on

paragraph 6.3.2 of the T-B Procedure TBP-6, which stated that the procedure required qualification of all welds to the NB, NC, and ND sections of the ASME Code. Not mentioned in the allegation, but contained in the procedure, were the words "as applicable."

Welding procedures WP 1.1 to WP 1.7 were used on non-Code welds or on welds joining materials of less than 5/8" thickness, which do not require qualification for Charpy impact testing. As a result, there was no need to do any impact testing since that qualification was not required. Accordingly, this area has neither safety significance nor generic implications.

The final three areas of the alleger's concerns involve filler material used on welds. They are that:

- Carbon steel filler material was used on stainless steel welds or that stainless steel filler material was used on carbon steel welds.

- Welds were incorrectly made using carbon steel filler material and later repaired with 309 stainless steel filler material.

- Bi-metal welds were made with carbon steel filler material and not 309-stainless steel, as required.

These welding errors were found and corrected from 1979 to 1983. In each case an NCR was written, the necessary changes were made, and the NCR was closed.

NCRs W3-1409 and W3-3438 covered the removal of improperly used carbon steel weld material and the rewelding of the seam with stainless steel and were closed respectively on November 14, 1979, and May 27, 1982.

NCR W3-4565 was used to document the rewelding of a bimetallic weld after it was learned that carbon steel weld rod had been used. This NCR was closed January 24, 1983.

This allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-24

Characterization: The allegation is that the Fischbach and Moore (F&M) response to LP&L construction quality assurance (QA) comments on the containment building electrical penetrations was not adequate.

Assessment of Allegation: The implied significance of this allegation is that improperly welded and inspected penetrations could cause the quality of the installation to be in question.

The allegation arose from an April 23, 1983, F&M letter to LP&L which covered six specific containment electrical penetrations (Nos. 101, 111, 118, 125, 133, and 135) and covered responses to LP&L construction QA comments on the documentation packages.

The QA comments involved the following three concerns: (1) the lack of nondestructive examination (NDE) of welds; (2) a lack of inspection initials for weld bead width; and (3) missing inspection reports.

The NRC staff reviewed the three concerns as follows:

1. The basis for F&M not performing NDE on the seal weld for the penetration header plates was related to problems that had been identified with the "Lee plugs" or gundrill plugs on the penetrations. This issue was identified and resolved as part of Nonconformance Report No. W3-1755.

   Although the lack of NDE to demonstrate weld adequacy was an apparent problem, the basis for this deviation was the fact that F&M work on penetrations was only for the secondary side of the penetrations. The primary side welding was performed by Tompkins-Beckwith (T-B) and included "N" stamping, in accordance with ASME Code requirements. The primary side welding was considered the safety-related boundary. The NRC staff found the resolution of this issue to be adequate.

2. The lack of inspection sign-off (initials) for the weld bead width was related to the inspection report form, which did not require an initial for this line item. However, the form did require an initial for verification that the welders and inspector's stamp was applied to indicate weld acceptance. Based on the Quality Control Check-list sign-off, the initials were then added for the weld bead width indicating acceptance. The NRC staff found this action to be adequate.

3. To resolve the problem of the missing inspection reports, F&M included copies of existing inspection reports to make the packages complete. The NRC staff found this acceptable.

The NRC staff concludes that all comments were adequately addressed. This allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-25

Characterization: It was alleged that Chicago Bridge & Iron (CB&I) quality assurance (QA) record deficiencies pertaining to welding on containment building penetrations could affect the validity of the integrated leak rate test (ILRT).

Assessment of Allegation: During discussions with the alleger, the NRC staff informed the alleger that the staff had witnessed the ILRT. On April 29, 1983, the containment building was pressurized above the required peak pressure of 44 psig and held there for twenty-four hours. The fitted mass point leakage rate was calculated to be 0.066 percent of the contained mass per day. The acceptance criteria for the peak pressure ILRT is that the measured leakage be less than 0.375 percent per day. When informed of the successful test results the alleger agreed that the QA record deficiencies noted did not adversely affect the ILRT. In a later conversation with the SRI, the alleger stated that he was satisfied that the CB&I issues had been adequately resolved.

This allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-26

Characterization: The allegation is that interoffice correspondence, dated April 9, 1983, from EBASCO to LP&L (File Reference CMH #83-601), implies that nonconforming conditions may not have been properly identified and corrected by EBASCO, thus having hardware impact.

Assessment of Allegation: The implied significance of this allegation is that without proper identification of nonconformances and proper corrective action, the quality of installation may be questionable.

EBASCO and LP&L issued a series of interoffice memoranda, including the subject correspondence, to discuss the status of various open items related to Start-Up System (SUS) SUS-48, Containment Vessel.

The NRC staff reviewed this interoffice memoranda and correspondence and found that the problem with the containment vessel documentation had been identified as a result of an EBASCO quality assurance installation review group (QAIRG) review, and that the problem was discovered when Chicago Bridge & Iron (CB&I) turned the documentation over to EBASCO.

The NRC staff found that EBASCO had properly identified and resolved the nonconformance problems on EBASCO QAI 9.2, Deficiency Reports (DRs). The requirements for upgrading of DRs to nonconformance reports (NCRs) were complied with when required (e.g., NCR W3-6231), and the interoffice memoranda and correspondence were issued to discuss open item status.

The NRC staff concluded that the subject correspondence was used only to document status and expedite closure of open items. All problems on the containment vessel were properly identified and dispositioned on DRs and NCRs. Additionally, the NRC staff conducted an interview with the correspondence originator, who said that the status was obtained by reviewing the QAI 9.2 DRs and this listing was for information to further status and expedite open item closure.

The NRC staff concludes that this allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-28

Characterization: The allegation is that the previous job experience was not verified and that resumes were falsified for QC inspection personnel from Mercury, Peabody, Sline, Tompking-Beckwith (T-B), Gulf, and Fischbach & Moore (F&M).

Assessment of Allegation: This allegation implies that contractor QC inspection personnel may not have been qualified because of a lack of previous experience, and that this fact may have been covered up by falsification of resumes. This allegation could have safety significance if unqualified personnel performed inspections of safety-related systems.

The NRC staff investigated this allegation by reviewing inspection personnel packages for Mercury and T-B in line with the recommendations of IE Circular No. 80-22.

The NRC staff had previously determined, in Allegation A-02, that 37 of the Mercury QC inspection personnel and 38 of the T-B QC inspection personnel sampled were incorrectly certified due to insufficient previous experience or education.

The NRC staff could find no indication that the previous experience of Mercury and T-B inspectors had been verified. In addition, the resume of one Mercury QC Level II Technician appeared to be falsified. A few potentially falsified resumes are under review by OI.

This issue appears to have generic implications since the recommendation of IE Circular No. 80-22 were never presented to the contractors by LP&L as a requirement.

Actions Required: See Item No. 1 in the enclosure to the D. Eisenhut letter of June 13, 1984, to J. M. Cain (LP&L).

Task: Allegation A-30

Characterization: It is alleged that the field installation of the main steam line framing restraints inside containment (elevation +46 and above) are not consistent with the as-built drawings.

Assessment of Allegation: Review of this allegation by the NRC staff indicated that the as-built drawings of the main steam line restraint framing (elevation +46 and above) did reflect actual conditions in the field. The NRC staff randomly selected and inspected connections in the east and west main steam line restraint framing. Changes or modifications observed were documented in the as-built drawings. Overall configuration of the main steam restraints framing (east and west) appears to be installed as the drawings indicated. EBASCO, American Bridge (AB) and Tompkins-Beckwith (T-B) installed various sections of both (east and west) main steam line restraint framing.

The NRC staff did discover, however, that several bolted connections had not been inspected or documented. NRC staff examination of the east main steam line restraint framing indicated incomplete documentation and inspection. The licensee could not present documentation to verify that these connections had been inspected. A random examination of the west main steam line restraint framing also indicates missing documentation.

The NRC staff determined that this allegation has no safety significance or generic implications.

Actions Required: See Item No. 12 in the enclosure to the D. Eisenhut letter of June 13, 1984, to J. M. Cain (LP&L).

Task: Allegations A-32; A-50; A-83; A-84; A-85; A-86; A-121; A-128b; A-281; A-346

Characterization: The allegation is that as-built drawings may not reflect the actual plant configuration and that Ebasco QA document reviewers were told to change red-line drawings for Tompkins-Beckwith (T-B).

Assessment of Allegation: The implied significance of this allegation is that inaccurate as-built drawings may not have received adequate engineering review and approval and the required inspections may not have been accomplished.

The NRC staff addressed this allegation by reviewing the as-built program for Mercury and T-B. In addition to these reviews, 19 Mercury-installed systems were walked down and verified against the as-built drawings. Six T-B- installed small-bore piping lines (2" or less) were also walked down. All of the drawings reviewed accurately reflected the actual plant configuration. These drawings were reviewed and found to have the required engineering review and approval. (Also see Allegations A-35; A-187; A-208; and A-230.)

Allegations A-83, A-84, A-85, and A-86 address problems identified with the recording of heat numbers on as-built drawings. This requirement was not complied with as reported on Ebasco NCR W3-6786. The disposition and closure of this NCR is unacceptable to the NRC as stated in Allegation A-033.

The NRC staff could find no indications of document reviewers changing red line drawings or "doctoring" the quality records.

Based on the reviews conducted the NRC staff concludes that this allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-33; A-55; A-56; A-61b; A-61c; A-61d; A-61e; A-67; A-68; A-69; A-70; A-71; A-73; A-74; A-75; A-221; A-306 v&w; A-309; A-310; A-329

Characterization: The allegation is that EBASCO nonconformance reports (NCR) were not entered into the NCR system, were improperly dispositioned and closed without substantiating indications, and that a questionable trending problem was being utilized.

Assessment of Allegation: The implied safety significance is that improperly dispositioned NCRs could place the quality of installation in question, and a questionable trending program could cause uncorrected problems in the QA program to continue undetected.

The NRC staff conducted a review of selected EBASCO quality assurance (QA) records and the NCR tracking system. The selected NCRs were reviewed for content, compliance to procedures, accuracy, completeness of the disposition and final closure. The staff disclosed that 34 of 89 NCRs (38.2 percent) reviewed were improperly dispositioned.

The NRC staff evaluated EBASCO's NCR trending program. It was found to be adequate and was performing its intended functions.

The issue of NCRs not being properly entered into the EBASCO NCR system was addressed in detail in Allegations A-18, A-53, and A-283.

The following is a summary of the NRC staff review of EBASCO NCRs that contained questionable dispositions:

EBASCO W3 NCRs

NCR 7139 - This NCR involved field inspection for the horizontal seismic supports for Radiation Monitors RE-HV 5028S, RE-HV 5031S, and RE-HV 0200.65. Only the data for the RE-HV 5031S support was the correct attachment (see Attachment No. 2 of NCR). LP&L reopened NCR and corrected seismic support identification problem (see Attachment No. 4 of NCR). The NRC staff identified this problem and LP&L took action which was acceptable to the staff.

NCR-3912 - Involved nine 23J-2 type supports discovered during walkdown for which the fit-up inspection was by-passed. The original NCR disposition failed to address the actions required to prevent the reuse of the items. Attachment No. 14 of this NCR identified this issue which was resolved by stating "it was not required for the disposition of this NCR..." No other NCR was reopened or referenced to resolve the issue.

NCR-5565 - Identified that a QA inspector trainee signed off on the fuel handling building (FHB) crane quality verification (QV) inspections. the NCR called for a complete reinspection. There are no documents attached to this NCR showing a reinspection was performed. The NCR states "...corrective action per Attachment #4...," but there was no Attachment No. 4 to the NCR package.

NCR-5563 - Identified that a QA inspector trainee dispositioned NCR No. W3-1728, for the Fuel Handling Building Crane, for J. A. Jones QV Department. This in violation of the requirements of ANSI N45.2.6. The inspections in question were signed off on August 27, August 28, and November 6, 1979, and then by a co-signature on February 4, 1983, by a QA inspector who claimed to be present at the first inspection. This co-signature of the inspections in question eliminated the requirement for a reinspection called for in the recommended disposition. The co-signature was applied 3 years and 5 months later. The NRC staff found this to be a questionable disposition of the NCR.

NCR-6159 - A sample inspection of Tubetrack welding identified that prior to July 1982 an unknown quantity of welding was performed using WPS-"B" procedure without backing plates. This NCR raises the question of traceability problems that were not identified and addressed by the NCR. The NRC staff also found that the sample used when tensile testing the welds was questionable. The sample should have been representative of the weakest weld joint in lieu of the strongest (i.e., worst case example should have been used to conduct tests).

NCR-3919 - Was initiated due to a tubing crack discovered during a system hydrostatic test of instrument line PT-RC-0173, system 52A2, Reactor Coolant. This NCR also resulted in Significant Construction Deficiency (SCD) No. 61 being issued. It was determined that the tubing failure was a result of a manufacturing defect (process, not metallurgical), and an attempt was made to ascertain that all tubing of this specific heat number was reinspected. Due to the problem associated with traceability (being lost), the corrective action was to reinspect all tubing installations to locate this heat of defective tubing. The reinspection reportly located all installation locations. The NRC staff review of this NCR revealed that operational control record (OCR) installation packages indicated that approximately 530 ft. more tubing was installed than was received on site. This was also verified by a review of warehouse issuance records. The "Requisition on Warehouse" form had been changed using liquid paper and a subsequent entry had been crossed out with ink.

SCD 61 states that the tubing in question, Heat No. 466023, ½" tubing, was installed in 89 instrument locations. A sample of nine OCR packages for fuel handling building (FHB), reactor containment building (RCB) and reactor auxiliary building (RAB) systems were reviewed to verify where the tubing was in fact installed. The nine packages (10 percent) were randomly selected from the list used to disposition the NCR. Only one OCR package actually reflected that the tubing in question was installed. This was also verified by an NRC staff walkdown. The walkdown on the eight remaining OCRs revealed different heat numbers installed; however, the OCRs were in agreement with these heat numbers.

Therefore, the list used for dispositioning this NCR was invalid; this NCR and SCD 61 were also invalid, as was the testing and disposition.

NCR-6514 * - The problem of traceability for the weld being performed was still in question; not addressed. The NCR also questioned use of some Bergen-Patterson designed supports installed by Mercury without traceability. This problem was also not addressed by referenced attachment.

*These NCRs were closed out by referring to EBASCO letter F-61147E. The problem is that this letter did not close out these or other NCRs.

NCR-3941-RI * - Identified that support number one fit-up inspection was by-passed and the support had been completely welded out with only the welder's ID.

NCR-5819 * - Identified the problem of instrumentation supports being painted prior to final welded visual inspection. Disposition had been to inspect the welds through paint which was unacceptable.

NCR-6221 - Identified that Weld Control records were signed off by an individual who was not a certified Level II inspector. Sign-off was based on Letter of Designation. The NCR disposition referred to the Tompkins-Beckwith (T-B) (April 1, 1980) Quality Manual that was not in effect at the time the Letter of Designation was written (January 8, 1979). Also, a reference given in the Letter of Designation did not allow designee sign-offs and was in effect as of March 15, 1983; the Letter of Designation also failed to meet the requirements of ANSI N45.2.6.

NRC-6511 (Mercury-3336) - Stated that "during final inspection of installed I-Beam for support 1117-114, weld to existing beam 1A was rejected." The NCR only addressed the fact that the maximum gap was violated, but the weld was rejected for: (1) undersize, (2) lack of Fusion, (3) arc strikes, and (4) undercut. Mercury NCR 3336 recommended weld removal and rework. This recommendation was crossed out and only the nonconforming fit-up gap was addressed. There were no records of rework or reinspection, and only copies of Mercury's NCR were attached to EBASCO's NCR.

NCR-4219 (Mercury-614) - Identified a violation of QCP3110.4 paragraph 6. The nonconformance was that the sample system piping had been bent downward causing a low point in the piping. The piping was being forced down by support SLRR-188. QCP-3110.4 stated that "tubing must be properly routed." This disposition stated that "...tubing was re-evaluated after support SLRR-188 and sample line were installed, after completion of Penetration 29 work." There were no records for rework or reinspection to indicate satisfactory reinstallation of supports and sample lines.

NCR-7432 - Identified a problem with concrete preplacement and post-placement documentation. The documentation could not be matched because the identification of the various placements were on different quality control (QC) forms. Also, this NCR was dispositioned by stating "...this problem was addressed on other NCRs and therefore voided..." No specific references were used; therefore, this disposition is unacceptable. Also, a QA engineer approved the recommended disposition and then voided the NCR.

NCR-4137 - Identified material and weld problems on support SLRR-238. This NCR has been closed out but failed to have 3 of 4 required welds on "M" gusset plates completed. This problem was identified during a QA review and a discrepancy notice (DN) was issued for the missing welds. This is an example of improper NCR closure and reopening, and the use of an incorrect reporting system (DN in lieu of NCR).

*These NCRs were closed out by referring to EBASCO letter F-61147E. The problem is that this letter did not close out these or other NCRs.

NCR-4088 (Mercury-491) - This NCR identified numerous discrepancies found during a walkdown performed against drawing 160-T-035-A. There is no documentation that work was accomplished or completed. The only document attached to this NCR was a Quality Control (QC) Report which listed numerous references but none were attached. EBASCO could not locate the referenced documents.

NCR-5974 - Identified a problem with loss of heat number traceability for safety and non-safety grade related materials. This NCR was used to disposition approximately 150 to 200 DNs with "Q" prefix. NRC staff review indicated that in almost all cases loss of heat traceability was deemed acceptable. This NCR's disposition is questionable to the NRC staff. The problem still existed in that safety and non-safety grade material could have been mixed; i.e., there was questionable use of material with no pedigree or the material could have been the incorrect type and grade.

NCR-5564 - Identified the problem of performing the final weld inspection after the weld has been painted. This NCR was closed out referencing an EBASCO letter which stated" the inspection criteria will be without removing paint to inspect for undersize weld and lack of weld material where installation drawing calls for weld material to be deposited by the installer. This disposition is unacceptable because visual inspections also include an examination for welding defects, not just dimensions.

NRC-6786 - Identified that many Mercury NCRs were issued concerning the lack of heat numbers. These NCRs were closed by referencing a generic series of EBASCO NCRs. The EBASCO disposition stated that the possible heat numbers will be documented on the Mercury as-built drawings. This data is not recorded on the as-built drawings, however, the Mercury Company NCRs have been closed. The disposition of this NCR does not address where the required heat numbers were recorded or how traceability was maintained.

NCR-7177 - It was noted that Fischbach and Moore (F&M) violated Procedure QCP-309, 6.3.2.4, that is, they failed to test three additional expansion anchors for every anchor that failed. It was also identified that an uncalibrated pressure gauge was used on the tension tester and tension testers serial numbers were not recorded. The NCR disposition stated that "QCP-309 did not require recording of serial numbers;" this violates ANSI N45.2, Section 13, that requires the traceability of measuring and test equipment to point of usage. F&M should have written an NCR. Inspection Report (IR) 311-06-70 and IR 310-36-43 identified bolt failure due to excessive slippage. Dispositions prescribed by these IRs were in violation of QCP 309, Section 6.3.2.2(d) and 6.4.3.

NCR-7182, NCR-7180, NCR7181, NCR-7184, NCR-6723 - These NCRs also involve a violation of ANSI N45.2, Section 13 requirements in that QCP 309 did not require the tension testing equipment's serial number, calibration date, and pressure gauge number to be recorded.

NCR-7547 - Noted discrepancies against OCR-1830 and Mercury NCR-0806. The disposition of this NCR is unsatisfactory due to the system passing a hydrostatic test is used as the basis for acceptability of fit-up discrepancy between the union and tubing. This does not take into account the effects of service conditions such as vibration and cyclic loads, and an engineering evaluation was not performed.

NCR-1650 - Ungraded DN No. MC 2128, which identified that the pressure gauge on the anchor bolt tension tester, was found to be out of tolerance reading (+450 psi higher than actual). The NCR disposition was to retest all anchor bolts installed prior to the date the tension test guage was determined to be out of calibration. The question is how was it determined which bolt(s) to retest when QCP 309 did not require the recording of tester serial number, on the previous tests? NCR 1803 also referred to gauges being out of calibration. Also see NCRs 7177, 7182, 7180, 7181, 7184, and 6723.

NCR-6623 - Identified a heat number and signature being falsified. The tubing in question was removed and replaced in accordance with Mercury NCR 3696. The question was what was done to assure that no other heat numbers were falsified by Mercury, and who forged the signature and entered the heat number on QC Material Verification Mechanical Inspection Report? The NCR's disposition did not address the falsification question and the reference to SCD-57 deals only with traceability.

NCR-5586 - Weld Testing Laboratory was not surveyed (audited) and placed on the Approved Vendors List by Mercury prior to welder performance qualification taking place. This item was not addressed in the NCR disposition. Also, the statement provided by the test lab that "a Mercury inspector reviewed all tests," is not adequate. Mercury should have had the person(s) who performed this surveillance document this activity.

NCR-6165 - States "...welder R-1 is not qualified to this procedure..." The disposition states, "...Measures taken to preclude recurrence is required..." No objective indications of this action could be located.

NCR-7099 - Identified improper weld on cabinets 48A and 48B. Numerous problems were noted with this NCR disposition. FCR-IC-P-416, Revision 1, Sk-1, called for a fillet weld where a flare bevel weld was required. There is no documentation to adequately support the NCR disposition. Also, the evaluation of disposition by EBASCO states, "Evaluation indicates that the stresses are low." There is no documentation indicating what stresses were being referred to. In addition, the recommended disposition "that ESSE (EBASCO Site Support Engineering) evaluate the cabinet base metal cracks" was not addressed. Proper weld length could not be achieved because the incorrect sized embed plates were installed and there were bolt holes that had been filled with grout in the areas required to be welded. Weld size and length were not adequately addressed.

NCR-4593 - Disposition inadequate. See A-32 for details.

The NRC staff also discovered that the EBASCO requirement for having the NCR closed within a 20-day period or having an extension granted was consistently violated. The following table is an example of NCRs found to exceed the closure time requirements of ASP-III-7, Section 6.1.3.a:

TABLE OF NCRs NOT MEETING THE 20-DAY ACTION LIMIT

NCR No.	Issue Date	Verification of Disposition Date	Extension Letter Attached (See Notes for Explanation)
W3-6597	07/06/83	11/23/83	No
W3-6950	07/03/83	10/18/83	No
W3-6615	07/27/83	10/25/83	1
W3-6032	04/06/83	10/21/83	2
W3-5713	02/17/83	11/04/83	3
W3-4504/R3	07/08/83	12/03/83	No
W3-5124	11/06/83	09/13/83	4
W3-5063	10/22/82	10/19/83	4
W3-5071	10/22/82	10/19/83	4
W3-5070	10/22/82	02/09/84	4
W3-5074	11/04/82	10/19/83	4
W3-5232	11/08/82	10/13/83	4
W3-5231	11/08/82	03/19/84	4
W3-5398	12/13/82	02/01/84	4

Notes

1. Extension requested on October 6, 1983. Extension granted to October 20, 1983.

2. Extension requested on October 11, 1983, again on October 21, 1983. Extension granted to October 24, 1983.

3. Extension requested September 2, 1983, granted to September 30, 1983.

4. Extension requested on September 2, 1983, granted to September 30, 1983, but NCRs have no indication of this extension or any others.

This 20-day working requirement was removed from the ASP-III-7 procedure with the issuance of change issue "K." Issue "K," Section 6.3.1.a. now states "Monitor the status and required corrective action to assure timely completion." The definition of timely completion needs to be addressed.

The NRC staff also found that the 10 CFR 50.55(e) for evaluation for reportability did not include the proper engineering involvement. The evaluation was generally accomplished by a QA engineer only. ESSE apparently was not involved in the required engineering input.

W3-6530 - Identified a specific problem with EBASCO Letter No. W3-QAIRG-569 dated June 24, 1983, supplied by the alleger. This letter identified a T-B welding processing violation of EBASCO Specification 884-75, General Welding Requirements, Section II 6.04, which requires that the first weld pass in nuclear piping service shall be a gas tungsten arc weld (GTAW) process. Contrary to this requirement, T-B performed socket welds in carbon steel nuclear piping with a shielded metal arch weld (SMAW) process. NCR No. W3-6530 was issued on July 12, 1983, and was subsequently accepted by EBASCO

engineering based upon the welds passing hydrostatic test and liquid penetrant or magnetic particle testing. Based upon this action and the fact that the ASME Code was not violated, the NRC staff concluded that the disposition was satisfactory.

W3-7241 and W3-7218 - The NRC staff reviewed these EBASCO NCRs and found them to be adequately dispositioned and properly closed.

In conclusion, the NRC staff believes NCRs were improperly dispositioned and closed out without corrective action being completed. This allegation has safety significance and generic implications and is indicative improper management controls.

Action Required: See Item No. 6 in the enclosure to D. Eisenhut letter of June 13, 1984, to J. M. Cain (LP&L).

Task: Allegation A-35

Characterization: The allegation is that because of inadequate documentation, LP&L and EBASCO cannot verify that piping systems installed and inspected by Mercury, NISCO, T-B, and EBASCO, were completed in accordance with the ASME code.

Assessment of Allegation: Adequate documentation may not be available, to verify that systems were built in accordance with the ASME Code even though parts of systems may have been reviewed and accepted. Mercury, NISCO, and T-B (the contractors) installed safety-related piping and control systems, and EBASCO and LP&L reviewed and accepted the documentation of the work. The implied safety significance is that without adequate documentation, the acceptability of the work is questionable and the quality of the installation is indeterminate.

Documentation control procedures of the contractors, EBASCO, and LP&L were compared to the requirements of ASME Code, 10 CFR 50, and applicable ANSI N45.2 requirements. These procedures were found to be adequate. Implementation was verified by reviewing objective indications to substantiate documentation adequacy. Start up system (SUS) 52A, Reactor Coolant (RC) piping, was used as an example to verify the documentation relationship among NISCO, T-B, and Mercury.

The record turnover package for SUS 52A-2 was used to identify large bore, small-bore, and instrumentation interface with corresponding contractor identity and applicable Waterford Start Up Group (WSG) drawings. From the WSG drawings, NISCO's installation/weldment documentation turnover packages were obtained by referencing the RC ISO listing. Using EBASCO's piping component list, and sorting line number by ISO, small bore weldment packages of T-B were retrieved. Mercury's Master Instrumentation List cross-indexed the instrumentation called out on the WSG drawing to Mercury instrumentation tubing documentation packages.

Documentation packages were reviewed by the NRC staff to determine if:

1. Adequate/detailed quality records were maintained.

2. Records were reviewed for completeness prior to filing as historical records.

3. Inspection/test results were documented and traceable to the material.

4. Records were retrievable when required.

The NRC staff found that the contractors, EBASCO, and LP&L have implemented the program requirements. Therefore, the allegation has no safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-36

Characterization: A torque wrench utilized by Gulf Engineering for work on the Emergency Diesel Generators was 38 percent under calibration.

Initial Assessment of Significance: An improperly calibrated torque wrench may have invalidated the work performed while in an uncalibrated condition.

The NRC Office of Investigation (OI) has investigated this allegation because of charges of falsification and intimidation. They, in turn, returned two technical issues to LP&L for response. LP&L responded to these issues and took corrective action. The NRC staff addressed this item by a review and evaluation of the LP&L response and subsequent corrective action.

Technical Item No. 1 - The alleger reported that the exhaust pipes to both generators A & B do not have any type of cover over them. Subsequently, during normal rainfall the pipes fill up with rain water and leak in.o the engine compartment.

The alleger reported this problem because during work on diesel generator "B," to remove water and to repair damage in 1980, the torque wrench was found out-of-calibration.

Discrepancy Report No. 047 was written on September 24, 1980, to document the out-of-calibration torque wrench; however, the alleger stated that he was forced to accept it as is and the re-torque was never performed.

The corrective action taken to prevent further damage by rain water was to finish the roof over the diesels and to install elbows in the exhaust system. There has been no recurrence of this problem.

Technical Item No. 2 - Because of the uncertainty of the torque values achieved during work on the fuel nozzles, LP&L presented a recent (Spring 1984) work package where the nozzles had been torqued as objective indications of corrective action.

The NRC staff review of the work package indicated that the work was accomplished in accordance with established procedures and was acceptable.

In conclusion, the NRC staff found that although problems existed in 1980, the problems have been adequately corrected. Therefore, this allegation has neither safety significance or generic implications.

Actions Required: None.

Task: Allegation A-39, A-42

Characterization: Multiple allegations have been made that the nitrogen purge on piping systems was not performed prior to welding, specifically for diesel generator piping systems.

Assessment of Allegation: The implied significance of these allegations is that the ASME Code and contractor welding procedures may not have been complied with. The result could affect the acceptability of the welds.

The NRC staff addressed the issue by reviewing contractor (Tompkins-Beckwith) welding procedures and the ASME Code, and by physical inspecting of portions of the diesel generator piping systems. Specifically, the NRC staff selected for evaluation the lubrication cooling water system and the lubrication piping system. In both cases, the systems were found to be welded in compliance with the ASME Code requirements for purging. Since both systems were carbon steel, the omission of the purge was permitted by the Code and T-B Procedure 1.8. Additionally, the physical inspection of welds revealed no deficiencies. It should also be noted that nitrogen is not normally a welding purge gas, the gas normally used at nuclear construction sites is argon.

Based on this review the NRC staff concludes that this allegation, has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-43

Characterization: Improperly performed calibrations including improper humidity and temperature control in Magna Flux Company's test lab (office trailer).

Initial Assessment of Significance: Improperly calibrated instruments could invalidate the acceptability of safety-related systems.

This issue was addressed by a review of the response to this item provided by LP&L. LP&L stated that no purchase orders had been issued to the Magna Flux Company for work on the Waterford site.

The NRC staff review determined that calibrations were correctly performed in accordance with approved procedure. When procedures were violated, nonconformances were documented.

The OI investigation of allegations in this area has indicated that the alleger, when interviewed, stated that "I intentially overstated my concerns to get NRC attention." Since the scope of the work of this allegation (Diesel Generator Installation) did not require the calibrations to be accomplished in a controlled atmosphere laboratory, the calibrations were deemed acceptable.

In conclusion, this allegation has neither safety significance nor generic implications.

Action Required: None.

Task: Allegations A-48 and A-295

Characterization: The allegation is that there was a complete breakdown in the QA program between EBASCO and the Mercury Construction Company.

Assessment of Allegation: The implied significance of this allegation is that a "complete" QA breakdown could cause the quality of all Mercury construction work to be questioned and could imply that all work at the Waterford site might be questionable.

NRC Inspection Report No. 50-382/82-14, dated December 6, 1982, identified a partial QA program breakdown and imposed a civil penalty against LP&L. LP&L acknowledged a QA program breakdown had occurred between EBASCO, Mercury, and Tompkins-Beckwith. Therefore, the allegation, as stated, is true. A QA program breakdown did occur between EBASCO and Mercury construction company. Corrective action is discussed in LP&L's response to the civil penalty, SCD-57, and in LP&L's responses to preliminary questions asked by the NRC inquiry team.

The NRC staff performed an additional review in this area to determine whether LP&L identified and corrected the root cause of the QA program breakdown.

The NRC staff interviewed site workers, reviewed Mercury programs, procedures audits, and related documents with a goal of attempting to understand how the QA program breakdown occurred and how it could have been avoided.

Interviews

Through interviews with Mercury employees, the NRC staff learned that from mid-1978 through mid-1983, the Mercury Company had six different project superintendents, six different project engineers, and six different QA site supervisors. Site QA/QC personnel interviewed felt that they received little or no support from Mercury corporate QA management, that EBASCO and Mercury management were "in bed together," ran "roughshod" over QC, and that QA/QC decisions were constantly overridden by cost and schedule. This was said to have resulted in a high turnover of Mercury QC inspectors. Several QC inspectors were said to have written letters of resignation describing these poor conditions and were threatened with dismissal if these letters were not withdrawn.

Mercury Corporate Annual Review

Mercury Internal Audit No. 1-9-80 (January 8, 1980) documented that Mercury management had not reviewed the QA program since September 1978. The audit log showed this finding to be closed on the same date as the audit report. However, EBASCO Audit CBB/AEZ-83-2-3 determined that the audit was not signed off as closed and that only one annual review, for July 1981 to July 1982, had been made. This annual review was reviewed by the NRC staff. The staff concluded that the review did not have the appropriate scope or depth to adequately evaluate the Mercury site QA program.

Mercury Internal Audits

Mercury Internal Audit No. 1-11-80 (January 11, 1980) documented that an internal audit on QAM Sections 10, 11, 14, 15, and 17 was not performed in 1979, despite the requirement that internal audits are to be completed at least once a year. Mercury Internal Audit No. 5-11-82 (May 11, 1982) documented that QAM Sections 2, 7, 13, 14, and 15 were not audited during 1981. No Corrective Action Request (CAR) was initiated as a result of the 1980 audit, but CAR No. 44 was issued May 11, 1982, more than 2 years after the same finding in Internal Audit No. 1-11-80.

The NRC staff learned that Mercury had not audited QAM Section 5, Procurement, from 1978 through 1983 because, as they stated, they had purchased no materials. However, Mercury Letters WQ-1216 and 1225 (December 15, 1982, and January 4, 1983) discuss Mercury's issuance of a purchase order to Welders Testing Laboratory for welder qualification services in late 1978 that remained in effect as of January 1983. LP&L acknowledged this finding and stated that Mercury had also purchased calibration services from another firm. The NRC staff reviewed Mercury files and determined that QAM Sections 5, 12, 17, and 18 were not audited in 1980. The failure to audit Section 12, "Nonconforming Items and Corrective Action," is significant because of Mercury's apparent failure to take corrective action regarding their failure to perform management reviews and internal audits, and because Section 12 was not audited in 1981. The staff also discovered that QAM Sections 5, 14, and 16 were not audited in 1981, and that QAM Sections 5, 11, 12, 13, 14, 15, and 16 were not audited in 1983. Although the staff found response letters to audit findings describing corrective action in the file for calendar year (CY) 1979, no responses were found for CY 1980-1983.

This partial QA program breakdown has never specifically been reported to the NRC even though Mercury identified the deficiency in January 1980 and EBASCO identified the problem in June 1982.

Mercury Audits of Implementing Procedures

The NRC staff review of Mercury QA, construction, and special process procedures showed that Mercury had not audited the following Mercury Company procedures during the life of the project: MCP-2140, 2170, 2175; SP-650, 651, 652, 653, 654, 655, 656, 657, 658, 661, 662, 663, 668, 670, 672; WPS-B, P, G; BP-1; and WPS-WE-4. EBASCO Audit No. SW-82-6-1 (June 7, 1982) documented the finding that Mercury implementing procedures had not been audited.

Many subsequent documentation and hardware deficiencies identified were related to those procedures not having been audited by Mercury. In addition, on those areas that were audited, it appeared that special or supplemental audits should have been performed in addition to annual audits of these areas because of trends indicated by nonconformances, deficiencies, and audit findings.

Mercury Corrective Action Reports (CARs)

The NRC staff reviewed 143 CARs issued by Mercury Company from December 19, 1978, through August 9, 1983, including all CARs relating to audits. This review revealed that EBASCO should have been aware of adverse trends concerning audits at least as early as December 19, 1978. Other trends which should have been recognized and investigated by EBASCO concerned: (1) red line "as-built" drawing control and installation problems (for example, CARs 019, 024, and 025); (2) craft personnel that were not following procedures (for example, CARs 020, 021, and 022); and (3) failure to inspect welds because craft personnel were ignoring hold points and because of QC failure to inspect weld joint fit ups (for example, CARs 027, 034, and 061).

EBASCO Audit Program Observations

The EBASCO audit and corrective action systems did not function properly in that EBASCO audits NB-79-9-4, NB-80-8-3, and NB-81-5-1, performed in 1979, 1980, and 1981, stated that Mercury audited each section of the QA manual, despite the fact that the Mercury CAR log and two or more audits stated that internal audits were not conducted annually on each section of the Mercury QA Manual. EBASCO Audit SW-82-6-1 (June 7, 1982) finally identified Mercury's failure to audit their QA program.

Other additional problems were identified in the above EBASCO Audits which should have alerted management to problems with Mercury as early as September 1979. It is not apparent that any action was taken as a result of the issues found during the audits.

LP&L Management Audits of the Site QA Program

The NRC staff reviewed these audits to determine if LP&L had regularly reviewed the status and adequacy of the program on site. The audits performed at the site between 1972 and August 1979 were not very comprehensive. They were essentially document reviews. Audits after this were more comprehensive, but were not thorough enough to cover all elements of the QA Manual and implementing procedures.

Site Audits Scheduled Versus Audits Performed

The NRC staff reviewed LP&L audits scheduled and performed from 1979 through 1984. The following table lists the audits scheduled versus the audits performed:

Year	LP&L Site Auditors	Scheduled	Performed
1979	4	193	80
1980	4	181	60
1981	4	178	53
1982	5	203	91
1983	5	168	42
	TOTALS	923	326

In justifying this discrepancy, LP&L representatives said that audits were not performed because LP&L QA Engineers and technicians were routinely diverted to support unannounced NRC inspections, Start-Up System (SUS) reviews, Construction Deficiency Reporting, and other unscheduled work. The existing manpower was insufficient to meet both routine auditing and special task assignments. An LP&L representative stated that there was no requirement for LP&L to conduct these routine audits.

The NRC staff found that this issue was identified as an audit system deficiency in 1979 during a management audit for LP&L by Middle South Services (MSS) (audit reports E79-6 (AFR E-88) (August 27 to August 31, 1979), and E80-15 (AFR E-122) (December 8 to December 16, 1980).

Corrective action was apparently not taken and it appears that no further action would have been taken to complete the scheduled audits since MSS Audit Report E81-12 reported the conduct of QA Audits and QA Construction site audits as "satisfactory" when only 53 of 178 of those scheduled were performed. Similarly, Audit Report E82-15 (December 6 to December 22, 1982) considered it normal when 91 of 203 scheduled audits were conducted. (Those performed may be fewer than those scheduled since these figures include reaudits and may also include QA surveillances, which are not to be considered as audits per ANSI N45.2.12.) This condition was discussed with the LP&L Site QA Manager, who did not consider these findings to be a problem.

LP&L Audit of EBASCO QA Program

The NRC staff reviewed LP&L audits of EBASCO site activities performed in 1981, 1983, and 1984. Nine audits were conducted in 1981, and seven in 1983, none of which were sufficiently comprehensive to meet the requirements of 10 CFR 50, Appendix B and LP&L QP 18.3, Revision 3. No audits were conducted during the first several months of 1984, which according to LP&L representatives was because of their need to support the NRC CAT inspection and due to NRC Waterford Task Force effort.

Conclusion

The NRC staff reviewed the Mercury audit program and determined that it failed to audit some key quality control and construction procedures where deficiencies occurred. Proper auditing of these procedures from 1978 through 1983 may have prevented the deficiencies identified against the activities of the Mercury Company.

In comparing procedures which had been audited with those that had not, there appeared to be a correlation between documentation problems and hardware deficiencies at Mercury Company, in addition to several significant breakdowns in the Mercury QA program, specifically those for the audit, nonconformance and corrective action systems. The NRC staff requested LP&L management to furnish existing documents which would demonstrate what contractor procedures had been audited by LP&L EBASCO, and other site contractors. the LP&L site QA manager and QA construction

engineer stated that they did not know what procedures had been audited during plant construction. LP&L representatives stated that they did not manage the audit function in this manner, but simply monitored auditing activities in a broad sense, and that there was no requirement to know what specific procedures were audited.

The NRC staff considers this failure to audit Mercury implementing procedures to be an issue that should have been identified in LP&L's corrective action response to the proposed civil penalty identified in NRC Inspection Report No. 50-382/82-14, issued December 6, 1982. LP&L's corrective action was inadequate in that LP&L did not thoroughly evaluate, determine all the causes, and identify the entire extent of the QA breakdown at Mercury Company.

As indicated above, LP&L, through EBASCO, had several opportunities to identify and correct the problems associated with Mercury.

The long held policy of LP&L has been to conduct their business related to engineering, construction, and operation of power plants by utilizing a very 'lean' in-house organization with almost total reliance on the Architect-Engineer (AE) constructor for engineering and construction. This policy of 'lean-ness' and almost total reliance on the AE/constructor is one of the root causes of the problems associated with Waterford 3. This problem was previously identified by outside consultants but was not acted on. LP&L staff was not sufficiently involved in the planning, monitoring, and control for site activities and site organizations were lacking in numbers and in commercial nuclear power plant experience necessary to effectively monitor and control the Waterford 3 project.

In conclusion, the NRC staff found that there was a breakdown in the QA programs at EBASCO and Mercury. Also, a breakdown of the LP&L QA program was indicationsd in that: (1) LP&L did not thoroughly evaluate, determine the root cause, and take effective corrective action to preclude recurrence of the identified problems; and (2) LP&L did not take action to implement the recommendations of its consultants and the NRC to increase its manpower and involvement with the Waterford 3 Project. LP&L's failure to effectively implement their QA Program has potential safety significance and the inadequate management controls which led to this QA breakdown, has generic implications on the question of management's ability to safely operate the Waterford 3 facility. Other NRC Task force findings identified in this SSER are further indications of the QA program breakdown between EBASCO and Mercury and are indicative of a breakdown of the LP&L QA program. LP&L has been requested to address this issue.

Action Required: See Item No. 23 in the enclosure to the D. Eisenhut letter of June 13, 1984, to J. M. Cain (LP&L).

Task: Allegations A-49; A-78; A-87; A-123

Characterization: It is alleged that individuals were prevented from writing NCRs or forced to rewrite specific NCRs and that subsequent quality assurance (QA) documentation may be falsified.

Assessment of Allegation: The NRC staff assessed the technical aspects of four specific allegations. The implied significance of these allegations is that identification and correction of nonconformances may have been curtailed and may have impacted installed systems. Also, inadequate hydrostatic testing may have been performed on safety systems, which might not have been verified if QA documentation was falsified.

Allegation A-49 alleged that individuals were not free to write NCRs.

The NRC staff assessed this allegation in conjunction with Allegation A-283 by reviewing procedures utilized by Mercury, Tompkins-Beckwith (T-B), and EBASCO concerning the reporting, disposition, and correction of discrepancies, deficiencies, and nonconforming items.

The NRC staff found that adequate procedures existed to allow employees to report apparent abnormalities in facility construction. (See Allegations A-53; A-93.) The procedures specified that supervisors and management were responsible for specifying the processing and disposition of items, and that the emphasis was that other personnel were also responsible for reporting items.

The NRC staff found no indications, other than the allegers testimony, to indicate that contractor management exerted pressure on individuals or otherwise suppressed the writing of NCRs. The staff review revealed that the nonconforming conditions have been subsequently entered into the NCR system and the issues resolved. This allegation has neither safety significance nor generic implications.

Allegation A-78 alleged that NCRs written by Mercury quality control (QC) inspectors on welding problems were not processed by QA/QC supervisors or management, and that documentation was subsequently falsified to reflect the absence of nonconforming items.

The NRC staff evaluated this allegation in conjunction with Allegations A-81 and A-82 by reviewing data packages for 28 different Mercury Operational Control Records (OCRs) on various instrumentation lines. The staff also performed system walkdowns on 19 of these installations. Both the data packages and the systems walked down were found to be correct.

It should be noted that procedures on the disposition of welding discrepancies generally stated that weld defects that are in the process of inspection or repair were not required to be reported as nonconforming items, discrepancies, or deficiencies and that only the final inspection was required to be documented. The NRC staff agrees that this has been acceptable industry practice. Nonconformance reporting procedures also stated that reporting was a supervisory/management decision. The NRC staff found these reporting procedures to be adequate.

The NRC staff found the installations to be correct and the procedural requirements to be adequate. This allegation has neither safety significance nor generic implications.

Allegation A-87 alleged that a QA engineer assigned to Mercury, but employed by EBASCO, was forced by EBASCO QA management to rewrite an NCR.

The NRC staff reviewed this allegation by evaluating NCRs W3-6719, W3-6719/R1, and an unnumbered NCR. It was noted that the unnumbered NCR was dated August 17, 1983. The original NCR W3-6719 was dated August 17, 1983, and closed out on August 22, 1983, with an EBASCO note stating that the QA engineer's concerns were invalid due to the generalities voiced. This NCR was subsequently "voided" and reissued as Revision 1. NCR W3-6719/R1 was issued on August 23, 1983. The staff could not determine if the individual had been "forced" to rewrite the NCR. The NRC staff reviewed NCR W3-6719/R1, which was closed out on October 13, 1983. The above hydrostatic test conditions were assumed by EBASCO to be the "worst case" and therefore that "all" other hydrostatic tests performed by Mercury were deemed satisfactory. This was not the case, since only one test was reviewed by EBASCO.

Due to the items noted above, the NRC staff determined that EBASCO QA management had improperly dispositioned and closed NCR-6719/R1.

Allegation A-123 alleged that EBASCO QA records reviewers working on Mercury records were not allowed to look in the field because they were finding too many problems, and that reviewers working with T-B encountered similar problems.

The NRC staff reviewed EBASCO QA procedures which defined document review responsibilities. The staff's review revealed that those procedures adequately addressed the responsibilities of QA records reviewers, and that the procedures provided detailed instructions for the collection, handling, status, and review of QA records for construction and installation. The procedural requirement for field verification was established in EBASCO procedure QAI-9 which stated, "Concerns regarding discrepancies in plant configuration shall be brought to the attention of the EBASCO QA Surveillance Group for action." This statement was not a requirement making it necessary for a QA records reviewer to go into the field.

EBASCO QA/QC review and verification groups were available to the records reviewers for any field work. The NRC staff investigated this allegation in conjunction with Allegation A-283. This allegation has neither safety significance nor generic implications.

Actions Required: With regard to Allegation A-87 (NCR W3-6719/R1) see Item No. 6 in the enclosure to the D. Eisenhut letter to J. M. Cain dated June 13, 1984.

Task: Allegations A-53 and A-93

Characterization: It is alleged that identifying and clearing problems was difficult due to an "almost non-existent" program, and the Document Reviewers had no way of reporting problems.

Assessment of Allegation: The implied significance of this allegation is that nonconforming items may not have been identified or corrected.

The NRC staff reviewed the EBASCO and sub-contractor's procedures for nonconformance identification and found that an adequate system did exist. The allegation, however, alludes to the existence of a system "road block" that prevented the processing of nonconformances and discrepancies. (See Allegations A-18 and A-164.) The NRC staff did find indications of NCRs that were "Voided" or "Could Not Be Located" (see Allegations A-18 and A-232). A total of 33 NCRs were voided, and 12 could not be located in the EBASCO card index. Ten other NCRs listed on the card index could not be located in the EBASCO QA Vault. One NCR in the QA vault was not on the card index. The ten "voided" and "missing" NCRs are the only indications of problems with NCR processing that the NRC staff detected during this review. The basis for these allegations may have existed at the time the allegation was made, but the staff could find no indications that the problem existed at the time of this NRC review.

This allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-54

Characterization: It is alleged that there was a failure by EBASCO and site subcontractors to implement their procedures.

Assessment of Allegation: The implied significance of this allegation is that the lack of procedural implementation could cause installations and inspections to be invalid and thereby render the quality of installation as indeterminate.

The NRC staff assessed this allegation to determine if failure to implement procedures was generic (site wide). The staff: (1) examined EBASCO's program for controlling the preparation, approval, and revision of site procedures; (2) walked through EBASCO and Mercury procedural interface; (3) verified that NISCO, Tompkins-Beckwith (T-B) and Mercury reviewed turnover quality records in accordance with procedural requirements; and (4) examined the corrective action mechanism for enforcing procedural implementation.

EBASCO Program for Controlling Site Procedures

EBASCO's program for procedure review and approval includes procedures generated by EBASCO engineering and all site contractors. The site quality assurance engineering department and/or other EBASCO disciplines, as required, reviewed procedures affecting quality prior to implementation. Regarding EBASCO's review and approval of site procedures, see Allegations A-188, A-190, A-191, and A-193.

Mercury/EBASCO Procedural Interface

The NRC staff obtained a copy of EBASCO's review, approval, and comments for the initial and current revision of Mercury's QA Records and Control Procedure (QCP-3010). The objective was to verify that EBASCO had reviewed and approved Mercury's procedure prior to implementation. These documents contained recorded comments with resolution, and approval granted to Mercury for procedure issuance and implementation.

A number of Mercury turnover QA documentation packages for the Reactor Coolant instrument lines were reviewed by the NRC staff. These packages had been reviewed and approved by Mercury's QA Document Review personnel using procedure QCP-3010. EBASCO QAIRG also reviewed and approved these packages using procedures QAI 9 and supplement QAIRG No. 15. The results of package and other Mercury documentation reviews are discussed in Allegations A-308, A-183, A-184, and A-197.

Mercury, NISCO and T-B Turnover QA Records Review

The NRC staff reviewed startup system 52A, Reactor Coolant, to verify generic procedural implementation for turnover QA records. Mercury, NISCO and T-B performed QA records reviews in accordance with approved procedures. EBASCO QAIRG conducted a 100 percent review of contractor documentation packages. LP&L used a 10 percent sampling plan, based upon Mil-STD-105D, to review and audit turnover packages.

NRC staff observed that:

1. Quality record reviews by contractors, EBASCO, and LP&L were adequately documented (stamped, signed, and dated).

2. Structured checklists were used to designate the status of records and nonconformance actions and to accept records.

3. Reviews were conducted for technical adequacy, completeness, proper form, legibility and authenticity.

4. Inspection/test results were documented in detail and traceable to installed hardware.

For additional detail of Mercury, NISCO, T-B, EBASCO, and LP&L review of SUS turnover QA records, see writeups for Allegations A-35, A-143, A-150, A-162, A-163, and A-308.

Corrective Action:

When, in the judgement of contractor QA/QC personnel, a nonconformance required corrective action, or a recurring condition existed, a request for Corrective Action Report (CAR) was initiated. Corrective action included:

1. Determination of cause.

2. Recommended course to prevent recurrence.

3. Implementation.

4. Follow-up to verify effectiveness.

EBASCO performed inprocess audits (surveillance) of construction activities. The NRC staff reviewed a number of surveillance report results. Included in these audits were the evaluation of contractor nonconformance reporting and corrective action to prevent recurrence. NRC noted that corrective action was used to enforce procedural implementation. Allegation A-186(a) details NRC staff review of EBASCO surveillance reports.

Additionally, during the NRC review of all allegations, numerous procedures were reviewed and found to be adequate.

In conclusion, based upon information reviewed, the NRC staff found that site procedural implementation was verified as adequate. Therefore, this allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegations A-57 and A-314

Characterization: It was alleged that Mercury Construction Company Level III inspection personnel had no certifications to inspect at the Waterford site and that two Level III inspectors, the Corporate QA Manager and the training officer, were not qualified to be certified due to insufficient education and previous experience.

Assessment of Allegation: This allegation implies that the Level III inspection personnel were not certified and that two Level III inspectors were not qualified due to insufficient education and experience. If true, this could affect the certification of Level I and Level II inspection personnel performing safety-related inspections, thereby rendering the verification of the quality of safety-related systems indeterminate.

This item was addressed by NRC staff review of Level III inspection personnel packages, certifications, and resumes. The NRC staff found that 13 Level III inspection personnel at Waterford had certification records on file. The certifications did not mention the Waterford site specifically, neither did the certifications for all levels of Mercury inspectors. The Level III inspectors were found to have been certified.

The NRC staff reviewed the certifications and supporting documentation for all site Level III inspection personnel, including the two in question. The certifications of three Level III personnel reveal that they lack sufficient prior experience, although the certifications for the two inspectors in question were found to be acceptable.

This item has potential safety significance. The questionable certifications will be tracked with Allegation A-02.

Actions Required: See Item No. 1 in the enclosure to the D. Eisenhut letter of June 13, 1984, to J. M. Cain (LP&L).

Task: Allegation A-58

Characterization: It is alleged that many permanent plant items were not being properly maintained by sub-contractors, EBASCO, or LP&L and that the items are rusting in place, even though such maintenance was the responsibility of LP&L and its contractors.

Assessment of Allegation: The implied safety significance of this allegation is that permanent plant equipment may have been damaged due to lack of preventive maintenance.

During the review of this allegation, the NRC staff noted that LP&L, EBASCO, and other sub-contractors had written care and maintenance procedures. These procedures appeared to be in accordance with ANSI N45.2.2, to which the licensee was committed.

The allegation stated that tube track, hangers, supports etc., were not maintained by Mercury or EBASCO. The NRC staff's detailed review of LP&L and EBASCO audits indicated that a basic maintenance program was utilized during construction. LP&L and EBASCO audit reports further indicated that Mercury had some deficiencies in their care and maintenance program. These deficiencies were cited in the audits and corrective action was initiated. These were no nonconforming conditions and the deficiencies did not require generation of an NCR.

Galvanized tube tracks, sway struts, and structural items were classified as storage Level D items. Level D items could be stored outdoors in a designated area which was well drained and marked for storage. These items were to be stored on cribbing or equivalent means to allow air circulation and do not require a special care and maintenance procedure. They were inspected on an area basis, with the inspection documented by Mercury on Form 239, Material Handling and Storage Report.

Mechanical and hydraulic snubbers were classified as Level C storage items. Level C items require indoor or equivalent storage. These supports did have a special care and maintenance procedure. A sample review of EBASCO's main warehouse QC care and maintenance reports indicated that from February 1977 to September 1983 monthly reports were completed for care and maintenance of those items. To address the problem of rusting in the field, memo #F-55764E, dated October 14, 1981, was issued requiring all onsite contractors to notify EBASCO Services of any permanent materials requiring painting prior to installation in the reactor containment building.

NCR W3-6940 documented a good example of the concerns expressed in this allegation. The NCR stated that "Indications are the items identified in the component description above (Bergen-Paterson Hangers issued to Mercury) were degraded by the Mercury Company as a result of storage and handling practices and techniques." An NRC staff review of the above statement indicated that the supports in question were either sway struts or mechanical snubbers. Mechanical snubbers were Level C items and were stored in a warehouse. They were only requested from the warehouse prior to installation, so that there was little chance for their degradation. An EBASCO representative also stated that Mercury

did not install any mechanical snubbers. Rigid supports such as sway struts were installed by Mercury. These were Level D items and required very little maintenance, except to ensure that the grease preservatives were still effective. This was done during care and maintenance inspections performed by EBASCO and Mercury.

NCR W3-6940 also stated that "Inasmuch as there is no documentation (Form(s) 239) available, it is indeterminate as to whether the Mercury Company performed any final location inspection of items identified in the description above." A detailed examination of the issues raised in this statement by the NRC staff indicated that the review of the EBASCO records review group was done after Mercury left the site. Mercury in fact did not leave records (Form(s) 239) for permanent plant files. However, ANSI N45.2.2, paragraph 6.6, "Storage Records," does not require care and maintenance inspection results to be kept as permanent plant records. Contract specification W3-NY-15 did not require these records to be kept as permanent plant records.

Additionally, the NRC staff reviewed preventative maintenance performed on safety-related rotating shaft equipment, tanks, and instruments. EBASCO prepared Construction Maintenance Instructions for this equipment and issued these instructions to the responsible contractors.

Responsibility for preventative maintenance was transferred to LP&L at the time of equipment turnover. The NRC review of contractor maintenance records revealed an adequate history of preventative maintenance, from receipt through installation to equipment turnover. LP&L maintenance records were also reviewed and demonstrated a continuation of adequate preventative maintenance following equipment turnover. The review for contractor-controlled equipment included: low pressure safety injection and high pressure safety injection pumps and motors, emergency diesel generators, emergency feedwater pumps and motors, and shutdown heat exchangers. The review for equipment currently controlled under the LP&L system included: low pressure safety injection pumps and motors, various pressure indicators, and transmitters.

The safety significance of this issue would be minimal because even without inplace inspection of supports and hangers, existing onsite procedures ASP-IV-121 and 138 were being implemented as final checks to assure that supports and restraints for the piping systems were properly installed and would perform their intended function.

In conclusion, LP&L and EBASCO surveillance audits indicated that Mercury did perform care and maintenance inspections. The NRC inspection of plant safety-related items, whether in storage or installed revealed no discrepancies. This allegation had no safety significance and no generic implications.

Actions Required: None.

Task: Allegation A-59

Characterization: The allegation is that there was little control over nonconforming conditions, in that no Hold Tags were placed on items in the field by EBASCO.

Assessment of Allegation: The implied significance of this allegation is that nonconforming materials, parts, or components may not have been properly identified to prevent their inadvertent use or installation.

The individual who wrote the letter raising this concern is unknown to the NRC staff. On December 27, 1983, the Senior Resident Inspector at Waterford brought this concern to the attention of LP&L QA for action in accordance with NRC policy for handling technical allegations at that time. LP&L responded that EBASCO did not replace Mercury Construction Company Hold Tags that were hung in the field when EBASCO assumed the responsibility for Mercury's contract. EBASCO did renumber approximately 80 percent of the Mercury Hold Tags with the EBASCO Noncompliance Report (NCR) numbers. The remaining 20 percent of the hold tags were not required by EBASCO procedure. The NRC staff noted that not all NCRs required the use of Hold Tags. The EBASCO procedure for Processing of Nonconformances, Number ASP-III-7, Issue K, stated that when a Discrepancy Notice (DN) was upgraded to an NCR, the NCR number was added to the DN tags. If an NCR was generated on a discrepant hardware item not previously documented, a Hold Tag was to be prepared. Hold Tags were not issued for NCRs involving documentation deficiencies.

The NRC staff found that there is no Hold Tag Index, but that the Hold Tags are indicated on the open NCR status card file. The NRC staff obtained this information from a review of the EBASCO NCR procedure, and interviews with LP&L and EBASCO QA/QC personnel.

This allegation has neither safety significance nor generic implication.

Actions Required: None.

Task: Allegation A-61a

Characterization: It is alleged that EBASCO Nonconformance Report (NCR) W3-4504 should be reviewed by the NRC.

Assessment of Allegation: Because of damaged threads found during the inspection of an installed thermowell, EBASCO prepared NCR W3-4504 to cover the repair of the threads. An error during the repair work resulted in further damage to the threads. It was then necessary to make a seal weld between the thermowell and associated nipple to assure a leak-tight connection.

At the completion of all work, NCR W3-4504, Revision 2, was completed and closed. Later, four documentation discrepancies were discovered and NCR W3-4504 was reopened and designated Revision 3. Three of the four discrepancies resulted from an original requirement that the weld was to conform to Section III of the ASME Code. Since the load bearing capability of the damaged threads remains, it was determined that the seal weld was for leak-tight purposes only and not for load bearing purposes. Thus, its conformance to the ASME Code was not required. As a result, the discrepancies were no longer applicable.

The fourth discrepancy was that "there was no indications of a sign off by Mercury or Tompkins-Beckwith after the final corrective action was supposedly completed on Revision 3." Since the resolution of the discrepancies resulted from an engineering decision, EBASCO signed Revision 3. The other contractors had previously signed the earlier NCR revisions which reflected the completion of their work.

The NRC reviewed all the documentation supporting the closure of Revision 3, and concurred that the discrepancies were adequately resolved.

This allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-63

Characterization: The allegation is that equipment was not properly aligned or levelled when it was installed.

Assessment of Allegation: The implied safety significance of this allegation is that safety-related rotating equipment with improper alignment will not continue to function as designed.

In assessing this allegation, the NRC staff reviewed EBASCO Specification MC-1, General Specification Covering Installation of Mechanical Equipment, dated April 26, 1976, and Gulf Engineering Company Procedure PR 10.0, Traveler System, dated December 10, 1982. The NRC staff found that these installation requirements and controls were adequate. Additionally, the NRC staff reviewed the installation records (travelers) for the following equipment:

Emergency diesel generators
High pressure safety injection pumps
Low pressure safety injection pumps
Charging pumps
Emergency feedwater pumps
Reactor coolant pumps

The installation records were found to be complete and acceptable, including QC inspection results.

The NRC staff found that EBASCO Specification MC-1 was followed unless the manufacturer's requirements were more stringent or contained special requirements; in that case, those requirements were complied with. For example, the reactor coolant pumps were installed in accordance with the requirements established by the Nuclear Steam System Supplier, Combustion Engineering, and the pump manufacturer, Byron Jackson. Additionally, the staff observed a low pressure safety injection pump in operation. The pump and motor were operating with virtually no vibration, indicative of proper setting and alignment.

Accordingly, this item has no safety significance and is not indicative of any generic implications or management problems.

Actions Required: None.

Task: Allegation A-64; A-65; A-66; A-322

Characterization: The allegation is that EBASCO site letters F-63724E, F-61895E, and F-61147E imply that Mercury inspection activities may be unacceptable.

Assessment of Allegation: The implied significance of this allegation is that unacceptable inspections by Mercury could have permitted invalid installations to have gone undetected.

The NRC staff reviewed the letters identified in this allegation. The staff also reviewed Mercury letter WA-2065, February 25, 1983; EBASCO letter F-61120E, January 13, 1983; and Mercury letter WA-2014, December 21, 1983. The numerous solutions called for in these documents were implemented, and resulted in the issuance of approximately 100 nonconformance reports (NCR) and discrepancy notices (DN). As a result of the reinspections required by the above letters, and the issuance of two Significant Construction Deficiencies (SCDs), SCD-57 and SCD-84. The staff concluded that sufficient inspection was performed.

The NRC staff concluded that the problems identified in the EBASCO letters were subsequently identified in the EBASCO nonconformance system. EBASCO has performed the necessary additional work and inspections to bring the Mercury installation work up to an acceptable level. The NRC staff found this action to be acceptable. This allegation therefore has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegations A-81 and A-82

Characterization: The allegation is that changes were made to N-5 documentation packages for instrument lines without the knowledge of the authorized nuclear inspector (ANI) after his approval signature had been placed on the package.

Assessment of Allegation: The implied significance is that the requirements of the ASME Code, Section III, NA-8000, were not complied with because the completed Code Data Reports were incorrect.

The NRC staff reviewed N-5 data packages for 28 different instrument lines. There was no indications of changes to N-5 data after the ANI's approval. The NRC did not interview Mercury's ANIs, as they were not available onsite. The staff did, however, interview the EBASCO ANI who was not aware of any changes made to N-5 packages after the Mercury ANI had approved them. Three instrument lines were found to have conflicts between the drawings, weld records, and N-5 data. DPT-RC-120/121 (low pressure) N-5 data showed field welds FW-1C, 1D, 51, 61, and 31 which were not on the drawings or final weld records. Field welds FW-47, 56, 57, 72, and 73 were on the drawings and weld records but were not on the N-5 Data Report. DPT-RC-120/121 (high pressure) had FW-30 and 31 on drawings and final weld records but were not on the N-5 Data Report. DPT-RC-124Y (high pressure) showed FW-15 on the N-5 data form but not on the drawing or the final weld records. The NRC staff conducted a walkdown of the three lines. The walkdown revealed that the drawings accurately reflected the installed system. LP&L initiated a Site Surveillance Report to document and follow-up on these discrepancies.

The NRC staff found no indications of changes to N-5 data having been made after the ANI's approval, and the staff's walkdown of the three lines that had deficiencies in the N-5 data revealed that the hardware installed was accurately reflected on the drawings and supporting QA records. The NRC staff concludes that this allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation Nos. A-88, A-89, A-90, A-91, A-315

Characterization: It is alleged that the hydrostatic testing required by the ASME Code for instrumentation and control tubing (ASME Code Class 2 and 3 piping) systems installed by the Mercury Construction Company had three different but related problems: (1) that EBASCO Nonconformance Report (NCR) W3-6719 concerning hydrostatic test pressures was improperly closed; (2) that test data sheets were missing or had incorrect static head calculations, and were unsigned during field tests; and (3) that test gauge readings were improperly recorded.

Assessment of Allegation: According to the ASME Code, at the completion of assembly work on a piping system, a hydrostatic test must be performed to verify the integrity of the system. The system involves introducing water into the system at a pressure that is 1.25 times greater than the design pressure for the piping. Prior to the test, a test instruction sheet describing the steps to be taken during the startup, running, and completion of the test is prepared; any special notes are included. A hydrostatic test data sheet is also made, which includes specific information about the system being tested, such as design pressure, test pressure, and minimum test pressure. During the test, the readings from two gauges located in close proximity are recorded on the test data sheet.

First, it was alleged that an ASME Code violation occurred because of underpressurization of some systems.

The NRC staff learned that NCR W3-6719 resulted from an EBASCO letter that questioned whether the additional pressure resulting from the static head of water present during the hydrostatic test had been considered in determining the system test pressure. The accompanying examples were based on the principle that the minimum hydrotest pressures should occur throughout the whole system.

EBASCO Site Support Engineering (ESSE) responded to the NCR by stating that the hydrostatic pressure had been adequate. They based their rebuttal on ASME Code Interpretation III-1-78-11, which states that "for piping systems it is a requirement of NB, NC, ND, NE, NF, NG-6221(b) of Section III that all items within a designated and protected system be hydrostatically tested at 1.25 times the system design pressure at the location that determined the design pressure." This is considered the system's lowest point. The system design pressure at this point includes the pressure created by the static head of water present in the system.

The NRC staff agreed that this interpretation always results in the lowest design pressure and corresponding lowest test pressure at the highest point in the system. The staff believes that the appropriate pressure was considered in determining the system test pressure. Thus, this part of the allegation has neither safety significance nor generic implications.

Secondly, it was alleged that neither the information needed to determine the static head pressure nor the resulting calculation were available or included in the record package, and that not all the forms were signed.

The NRC staff found that most test instruction sheets contained statements that "static head pressure for this test is within the ± tolerance given for test pressure on Attachment A (Hydrotest Data Sheet) and that if the test is conducted within these tolerances then neither maximum or minimum pressures will be violated." The NRC staff reviewed the test instruction sheets and agreed that there was no information, as alleged, in the hydrotest package; however, the staff found that static head pressure was included in the hydrotest pressure, and concluded that determination of the static head pressure was not necessary and was only important to keep the hydrotest pressure within the tolerances specified. Thus, this part of the allegation has neither safety significance nor generic implications.

Thirdly, it was alleged that gauge readings during the hydrostatic test were improperly recorded, because the gauges should not have read the same pressure due to the deviations found during calibration readings.

The NRC staff believes it was very possible for the same recorded readings to occur, because both gauges were parallel (side by side). EBASCO kept sufficient control on gauge calibration to assure that at least one gauge was operational during all tests. EBASCO NCR W3-6719 stated that both test gauges were documented as having the same pressure readings, and that these pressure readings were "usually the same suggested pressure listed at the top of the test data sheet."

The NRC staff determined that, at the start of each test, EBASCO calibrated the gauges and verified the results. At the completion of the test, a second calibration was made. When the post-test results were out of tolerance, the data from that gauge were discarded, since only one operational gauge was needed to verify the hydrostatic test pressure. In all cases reviewed by the NRC staff, at least one value was within the tolerances required. Also, the NRC staff determined that any errors that might have occurred, such as loss of calibration, would have done so after the test, because EBASCO used needle valves to adjust the test pressure and to obtain close control of the exact test required. Thus, this part of the allegation has neither safety significance nor generic implications.

In assessing this allegation, the NRC staff also reviewed calculations and assumptions contained in the ESSE response to the EBASCO NCR, and found that the NCR was properly closed out. An interpretation by the ASME Code group which defined the method of calculating the hydrotest pressure negated the need for static head pressure calculations. The staff also reviewed Mercury hydrostatic test procedures and analyzed the validity of EBASCO's engineering calculations used in justifying the NCR closeout. The staff found the test procedures and calculations acceptable and in conformance with ASME Code requirements.

This allegation has neither safety significance nor generic implications.

Action Required: None.

Task: Allegation A-92

Characterization: The allegation is that EBASCO record clerks closing out document deficiency reports (DRs) were not qualified to do so.

Assessment of Allegation: The implied significance of the allegation is that unqualified personnel may have closed DRs for quality assurance (QA) records of safety-related systems which could be adversely affected.

The NRC staff reviewed EBASCO's records review system, training requirements for records reviewers, training files of records reviewers, and a sampling of closed out DRs.

The NRC staff found that EBASCO procedures required records reviewers to have a high school education, classroom training, on-the-job training (OJT), and reading assignments. The EBASCO system required document DRs to be initiated and closed out by records reviewers.

The NRC staff selected a random sample of work packages (QA records), and reviewed the records of 27 individuals who signed off document DRs in those work packages. Nine of the 27 individuals (33 percent) signed off document DRs without having completed the records reviewer training required by EBASCO.

The problem of incomplete training records for records reviewers, in particular OJT completion, was addressed by an EBASCO audit in October 1983. Subsequent action updated and completed those records or addressed open items, and the subject audit was closed in January 1984. The NRC staff reviewed that audit and concurred with the disposition action and closure.

The NRC staff concluded that there were no specific training qualifications or certification requirements for document reviewers in NRC regulations, ASME Code, or ANSI Standards. The EBASCO training program appeared to be adequate.

The NRC staff found that document DRs were closed by individuals who had not completed EBASCO records reviewer training requirements. However, corrective action by EBASCO satisfactorily addressed the problem, and work performed by records reviewers was considered satisfactory by the NRC staff. This allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegations A-94 through A-99

Characterization: There are six miscellaneous allegations relating to an unidentified nonconformance report (NCR) dated September 9, 1983, which makes reference to various problems with stainless steel piping and tubing.

Assessment of Allegation: The implied significance of this allegation is that improper reporting and corrective action of NCRs, missing quality assurance (QA) records, lack of access to necessary documentation and key personnel, and the lack of procedures could cause the QA process to be compromised and place the quality of construction in question.

The NRC staff reviewed these six allegations as follows:

1. Allegation A-94 - It was alleged that an individual had on file an unnumbered NCR and complete documentation on how EBASCO would not allow people to report problems. A copy of the NCR was obtained from LP&L and was identified as EBASCO NCR No. W3-6943. This NCR therefore had been properly entered into the EBASCO system.

2. Allegation A-95 - It was alleged that Attachment 1 of the "unidentified" NCR (W3-6943) states that two heat numbers had been used for three different schedules of pipe tubing. The NCR disposition was to: (1) "...provide a listing of suspect pipe runs..."; (2) "...QC to take UT measurements on suspected runs..."; and (3) "...evaluate any deficiencies reported by QC..." The purpose of this inspection was to determine if the proper schedule of material had been installed. The results of the UT inspection revealed that schedule 160 piping had been installed in the appropriate systems. This corrective action was acceptable to the NRC staff.

3. Allegation A-96 - It was alleged that Mercury Construction Company took a trailer full of documents to their home office. The removal of the documents was contrary to LP&L's commitment to ANSI N 45.2.9; however, the NRC staff determined that these records had been returned to the site. LP&L provided all Mercury records requested by the NRC staff during this review, even though the records system was cumbersome and retrieval was not always timely.

4. Allegation A-97 - The allegation is that EBASCO reviewers were not allowed access to heat number records and could not research the extent of the problems. Six EBASCO document reviewers were interviewed and all of them stated they had no problem obtaining access to Mercury records. The site QC supervisor of the EBASCO Verification Group stated emphatically that inspectors working for him physically checked tubing for heat numbers upon proper request from the document reviewers. There was no indications of EBASCO personnel being denied access to Mercury records. Although this allegation may have existed prior to and at the time of the allegation, access was not a current problem and all QA records requested by the NRC staff were available.

5. Allegation A-98 - The allegation is that Mercury Authorized Nuclear Inspectors (ANIs) were off limits to reviewers. The six EBASCO document reviewers interviewed, who were on site at the time of this allegation, agreed they had ready access to Mercury ANIs. There was no objective indications that the reviewers were denied access to the ANIs, although this situation may have existed prior to or during the allegation. Mercury ANIs were not available on site to be interviewed by the NRC staff.

6. Allegation A-99 - The allegation is that there are no procedures for review of documents. The NRC staff reviewed the following procedures and found them to be adequate for review of documents: EBASCO Procedure QAI No. 9, "Review and Handling of Construction-Installation Records," original issue dated October 31, 1979, current revision issued April 20, 1983; EBASCO Procedure QAI No. 9A, "Documentation Statusing Review Instruction," dated December 13, 1982; Tompkins-Beckwith Procedure TBP-20, "QA Records Turnover," dated February 7, 1983; and Mercury Company Procedure QPC-3010, "Quality Assurance Records Control," original issue dated September 7, 1978, current revision issued November 1, 1978. Although the use of supplemental procedures related to a particular contractor could be a improvement over the base procedure, the base procedure (QAI-9) was deemed adequate.

   Additionally, contractors' documentation packages were reviewed by the NRC staff and generally found acceptable; see Allegations A-143, A-150, A-162, and A-163.

   The NRC staff has determined that these six allegations had neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-100, A-101, A-102, A-103, A-127, A-128a, A-128c, A-285a

Characterization: The allegation is that the Mercury Construction Company had the following material traceability problems: (1) in one case a Mercury QA Supervisor directed clerical personnel to improperly add valid heat numbers to records when missing heat number were discovered; and (2) numerous cases where the original heat numbers were not transferred to the tubing when it was cut.

Assessment of Allegation: The implied significance of this allegation is that the records for material may not accurately reflect what is actually installed in the field, a condition which could affect the acceptability of safety-related systems.

The NRC staff addressed this issue by reviewing Mercury work packages for indications of added or changed heat numbers. After examining a random sample of heat numbers for tubing, fittings, valves, and filler material from the packages, the staff found that the records were adequate to show the acceptability of the material for its intended use.

The Mercury weld records were difficult to follow because of crossouts, weld deletions, additions, and a poor system of recording applicable notes. The records consisted of photocopied material and original pen-and-ink data. Falsification of heat numbers could not be determined from the staff review conducted. The NRC staff also walked down 19 installations to verify heat number markings and found the numbers to be correct.

Mercury QC and document review personnel involved in material traceability problems are no longer on site and were not interviewed.

Numerous NCRs and DRs were issued on material traceability problems. The following are typical examples.

NCR-W3-4593 - This NCR identified Mercury installed tubing which did not have heat number traceability. To resolve this NCR, five samples of installed tubing were cut and sent to a testing laboratory for analysis. The analysis revealed that the tubing was SA-213 Type 316, which was acceptable. The NCR was then closed, and the NRC staff considers this action acceptable.

NCR-W3-6943 and W3-7538 - These NCRs identified the loss of heat number traceability by Mercury, which caused a concern as to whether the thin wall tubing had been installed in the system requiring heavy wall tubing. To resolve this NCR the tubing was ultrasonically tested (UT). The UT identified that heavy wall tubing had been installed in the appropriate system and this NCR was closed. The NRC staff considers this action acceptable.

NCR W3-3919 - This NCR was initiated because of a tubing crack discovered during a Reactor Coolant hydrostatic pressure test. This NCR resulted in SCD #61 being issued. This NCR and SCD should be reopened because the testing and disposition were invalid. For details See Allegation A-33.

Discrepancy Report - An EBASCO quality control review turned up discrepancies in heat numbers for tubing unions between Mercury inspection records and system isometric drawings and issued a discrepancy report. The discrepancy report initiated Field Verification Inspection Requests to verify heat number

discrepancies and to correct Mercury inspection records to substantiate that installed hardware is accurately depicted on system isometric drawings. EBASCO QC made over 4800 such comparisons in correcting these discrepancies. The NRC staff review found this action acceptable.

In conclusion, the NRC staff found that Mercury's heat number traceability to installed material was adequate. Therefore, this allegation has neither safety significance nor generic implications. However, Allegation A-33 did identify some problems with heat number traceability.

Actions Required: None.

Task: Allegation A-107

Characterization: It is alleged that false documents were generated to replace missing records related to Cadweld activities.

Assessment of Allegation: The NRC staff reviewed and assessed the technical aspects of many allegations related to Cadwelding. (See Allegations A-156 and A-147.) Each allegation was resolved to the NRC staff's satisfaction as described in these assessments. Site personnel stated that discrepancies in signatures and initials on the Daily Cadweld Inspection Reports were the result of reconstruction of original reports that were soiled in the field, or that inspectors had to be in a physically awkward position during the inspection and had a second inspector record and initial the data. Regarding tensile test reports, the NCR addressing this issue stated that the original test records were in fact lost and that replacement records were generated based on records maintained by the testing company.

In addition to the review of the allegations described above, the NRC staff reviewed other records related to Cadwelds and looked for any obvious indications of falsified documents. Other technical areas were also reviewed. The NRC staff looked for documents which appeared to be extremely new, but which had old dates, errors in dates, duplicate originals, or other discrepancies. The NRC staff also reviewed other Allegations (A-110, A-115, A-146, and A-171) that were related to Cadwelds. The review revealed no obvious indications of falsified records. Thus, the NRC staff has concluded that the concern related to falsified records of Cadweld activities is not an issue affecting the technical data. This issue has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-109

Characterization: It is alleged that EBASCO Quality Assurance (QA) personnel stopped records reviewers when "wholesale" irregularities, some of which involved civil and perhaps criminal violations, were found in 70 of 1200 concrete placement packages which were reviewed.

Assessment of Allegation: In an EBASCO interoffice memorandum of June 6, 1983, it was stated that the "QAIRG-BOP" (quality assurance installation review group - balance of plant) was in the process of reviewing the civil QA concrete documentation in the QA vault when they were given oral instructions to cancel the review because EBASCO management claimed the documentation already had been reviewed by qualified reviewers under a qualified QA program. The June 6, 1983, EBASCO memorandum has as an attachment an EBASCO interoffice memorandum of December 9, 1982, which included discussion of a review of concrete placement packages during which each package was found not to provide adequate documentation.

On June 9, 1983, another EBASCO interoffice memorandum forwarded the two memorandums above, plus additional items, to the EBASCO Site QA Manager with a recommendation that the scope of the review of J. A. Jones documents be enlarged. On July 7, 1983, a meeting was held to discuss the review of concrete placement packages and to clarify the concerns expressed in the earlier memos which resulted in the recommendations.

On July 11, 1983, LP&L's project management group directed EBASCO to perform a 10 percent review of concrete placement packages, which began in August 1983. EBASCO (in a letter dated September 21, 1983) documented numerous deficiencies, which resulted in the initiation of a 100 percent review program of concrete placement packages. This effort, completed on January 30, 1984, addressed the placement packages for the common foundation basemat, reactor auxiliary building, reactor containment building; fuel handling building, and the shield ring and dome, under EBASCO Procedure QAI-9, Revision 1.

When the NRC staff completed the field work (May 25, 1984), the 70 packages related to the allegation had not been specifically identified within the total of nearly 1500 packages. On August 10, 1984, some documentation related to the QAIRG effort was located, however these records have not been reviewed by the staff as yet. This allegation will have to be addressed in the future.

Actions Required: Additional NRC staff work is required.

Task: Allegations A-110, A-130, and A-148

Characterization: It is alleged that inspectors from EBASCO (Civil & Structural), J. A. Jones, and Fegles Power Services did not meet all the requirements of ANSI N45.2.6, "Qualification of Inspection, Examination, and Testing Personnel for Nuclear Power Plants."

Assessment of Allegation: The NRC staff examined the qualifications of 17 inspectors at random: four from EBASCO Services Incorporated; five from J. A. Jones Construction Company; and eight from Fegles Power Services.

The qualifications of the four EBASCO inspectors were found to be in accordance with ANSI N45.2.6 and EBASCO Procedures WQC-121 and ASP-I-3.

The qualifications of only one of the five J. A. Jones inspectors were found to be in accordance with ANSI N45.2.6 and J. A. Jones Procedures POP-N-505, POP-N-605, and POP-N-702. In its review of J. A. Jones inspector qualification files, the NRC staff discovered one Level I Cadwelding inspector who was certified on May 8, 1979, based on a high school education and only four of the required 12 months of experience. Level I inspectors perform preweld and postweld visual inspection of Cadweld splices. A NRC staff review of daily Cadweld inspection reports indicated that the inspector performed preweld inspection only; final Cadweld inspections were performed by a qualified J. A. Jones inspector.

The Project Quality Assurance Manager (PQAM) also waived time and experience requirements to certify the same inspector for Level I inspection work for concrete, structural, and reinforcing steel because the inspector demonstrated proficiency in field work. The inspector was certified as Level I in a letter from the PQAM of November 7, 1979, based on a high school education and 10 months experience, with the requirements for formal classroom training and proficiency testing waived. ANSI N45.2.6 and the J. A. Jones QA program require 1 year of experience in quality assurance, including testing or inspection of the appropriate construction or installation, and the satisfactory passing of the Level I examination for the appropriate discipline. The same inspector was certified as a Level II Concrete Inspector on March 12, 1980, with only 15 months experience and as a Level II Structural and Reinforcing Steel Inspector on May 7, 1980, with only 17 months experience, which is in violation of the J. A. Jones procedure requiring 2 years of experience.

Moreover, the same inspector was delegated to act for the PQAM, with all the authority of the PQAM, when the original PQAM was absent from the project on August 15-17, 1980; November 18-20, 1980; and January 27-29, 1981, even though the inspector did not meet J. A. Jones requirements for a Level III inspector which are: a high school education and 10 years experience.

A second J. A. Jones inspector was certified as a Level I, QC Inspector (structural steel; concrete-visual inspection), by a letter of November 28, 1975, based on this person's attendance at J. A. Jones Corporate QA training classes and on an evaluation of previous education and experience. The education consisted of a high school education, plus 1 year of junior college, while the experience consisted of 2 years as a secretary/draftsperson prior to

employment at Waterford 3 and approximately 11 months of the same experience after coming to Waterford 3. The experience reported did not meet the required 1 year of experience in construction quality assurance, including testing in the appropriate discipline or inspection of the appropriate construction or installation. No record was available to verify that the inspector had satisfactorily passed a Level I examination for the appropriate discipline, which is a J. A. Jones requirement. A discrepancy was also noted on the November 28, 1975, letter in that it showed that the inspector attended a training class (earthwork Level II) on June 14-16, 1976, even though the letter was signed and dated approximately 6 months prior to the class. Correction fluid (whiteout) was used on this document

A third inspector was improperly certified by J. A. Jones Company on November 24, 1975, as a Level II inspector (structural/concrete/visual inspection). This inspector had a college degree from a military academy and spent 3 years prior to coming to Waterford 3 as an Infantry Platoon Leader, a Maintenance Officer, and a Supply Officer. He did not meet the requirement of 2 years of experience in construction quality assurance, including testing in the appropriate discipline or inspection of the appropriate construction or installation. No record was available to verify that the inspector had satisfactorily passed a Level II examination for the appropriate discipline.

A fourth J. A. Jones inspector was certified in several areas as a trainee, but J. A. Jones procedures did not state the qualification requirements and duties of a trainee. He was certified as a Level I concrete inspector on September 8, 1978, with 8 months experience. He was certified as a Level I Structural steel inspector on September 14, 1978, with 8 months experience, and he was certified as a Level I earthwork inspector on September 22, 1978, with 10 months experience. In no case did he meet the requirement of 1 year experience in construction quality assurance, including testing in the appropriate discipline or inspection of the appropriate construction or installation.

The NRC staff was told by a person who served as a J. A. Jones supervisor in 1976 and 1977 that it was brought to his attention that some J. A. Jones inspectors did not meet the experience requirements. He then wrote letters waiving the experience requirements of those inspectors to satisfy the requirement that the discrepancy had been identified. The J. A. Jones QA program for the construction phase of nuclear power plants, Attachment F, "QA Personnel Training and Certification Program," allows the training and education requirements to "not be treated as absolute when other factors provide reasonable assurance that a person can competently perform a particular task."

Fegles Power Services was responsible for reinforced concrete construction and inspection associated the reactor containment shield building. The NRC staff review of qualifications for the eight Fegles Power Services inspectors found that six were in compliance with ANSI N45.2.6 and Fegles Procedure QAP-303-21.

The first inspector lacking in qualifications was certified as a Level III inspector based on a high school education and 1 year of experience as a draftsman-estimator for Fegles. The Fegles' requirement is that a Level III inspector have 4 years experience in testing or inspection (or both) for power plants, nuclear plants, or similar heavy industrial equipment or facilities.

The second inspector found lacking in qualifications was certified as a Level II inspector , based on a college degree (BSME) and 2 years of quality assurance work. However, he was assigned the duties of the PQAM for Fogles at Waterford 3. The PQAM must be a Level III. Although he met the requirements of a Level II inspector, he did not meet requirements for a Level III, which are a college degree from a 4-year accredited engineering or science school, plus 5 years of experience in quality assurance, including testing or inspection (or both) of equivalent manufacturing, construction and installation activities.

Additionally, based on the review of Nonconformance Report (NCR) W3-6234 and J. A. Jones inspector personnel files, the staff found that there were J. A. Jones Cadweld inspectors who performed Cadweld inspections prior to formal certification. Cadwelds inspected by these J. A. Jones uncertified inspectors were installed prior to November 24, 1975. Most (approximately 90 percent) of these Cadwelds were located in the concrete basemat. During the initial construction stage, EBASCO had a qualified quality control inspector doing overview inspection of the Cadwelds performed by J. A. Jones qualified Cadwelders. NRC staff reviewed the recommended disposition of Attachment II to NCR W3-6234 and discovered that the EBASCO qualified control inspector, in fact, only inspected about 5 percent of the 1200 Cadwelds which were inspected by J. A. Jones uncertified Cadweld inspectors prior to that date.

Based on the sample reviewed, it appears that early in the project there was a lack of experienced subcontractor inspection personnel in the civil-structural discipline, but the overall effort in quality control appears to have been successful in achieving adequate construction quality. Cadwelds inspected by uncertified inspectors were also included in the random testing program and proved to be acceptable by tensile test results. The NRC staff ascertained that, based the random test results (only 6 out of nearly 600 tests failed), the quality of the installed Cadwelds had not been impaired. Therefore, the NRC staff concludes that this issue has no significant impact on safety. This issue does have generic implications in that a pattern of waiving experience requirements was evident.

Actions Required: See Items 1, 10, and 20 of the enclosure to the letter from D Eisenhut to J. M. Cain (LP&L), dated June 13, 1984.

Task: Allegation A-111

Characterization: It is alleged that specifications and procedures used as acceptance criteria for concrete work were frequently ignored by J. A. Jones personnel.

Assessment of Allegation: The NRC staff independently reviewed 20 of 28 concrete basemat placement packages. The staff review of the 20 placements specifically sampled the first three blocks (blocks 1, 2, and 6) placed, since these placements preceded the Stop Work Order which was issued to achieve corrective action of improper placement activities. The NRC staff found several violations of specifications and procedures during this review, including:

- Out-of-tolerance concrete test results (air content, slump, mixing time, mixer revolutions, volume of water added),
- concrete testing frequency,
- vibrating (concrete and reinforcing steel),
- excessive movement of concrete,
- excessive lift height, and
- concrete curing documentation.

The NRC staff review of J. A. Jones records of the basemat placement packages showed that these violations were identified by EBASCO Quality Assurance (QA) in various placement packages. When a violation was identified, immediate corrective action was taken in the field, when possible. A discrepancy notice (DN), and when necessary a nonconformance report (NCR), was written to document the violation and to establish appropriate corrective action. If the violation involved a change in the original design specification, a field change request (FCR) or a design change notice (DCN) was written to address the violation. For further discussion on the above violations, refer to Allegation A-139.

Although specifications and procedures were violated during concrete placements, each violation was identified and documented by EBASCO QA, and corrective actions were taken.

Based on its review, the NRC staff has concluded that the quality control of the concrete placements was adequate in achieving construction quality. The NRC staff consultant made an independent evaluation of the construction activities and reached the same basic conclusion that the construction of the basemat was adequate to ensure the safety of the structure (see Appendix L).

This allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegations A-112, A-131, A-269

Characterization: It is alleged that certain J. A. Jones Construction Company concrete placement packages were incomplete, inspectors were not certified to inspect concrete placements, placement packages indicated a failure to implement specifications and procedures, and that records in the placement packages had been tampered with.

Assessment of Allegation: The alleger stated that concrete placement packages 765-1-35, 570-S03-31, 593-S01-UZ3ZAA, 558-2-31, 503-9, and 503-10 had records missing from the folders, including required documentation related to installation, inspection, acceptance of safety-related items, and testing. It was also alleged, based on a referenced memorandum, that J. A. Jones inspectors involved in concrete placement activities were not certified to perform those activities, that available documents indicated failure of J. A. Jones inspectors to implement specification and procedure requirements, and that J. A. Jones inspectors accepted items outside the criteria set forth in the project specifications and procedures. Also, the alleger alluded to records tampering in the form of unauthorized changes and additions to concrete placement packages; a specific example was the absence of a curing log for placement 593S01-UZ3ZAA, indicating a possible violation of 10 CFR 50, Appendix B, Criterion XVII.

The NRC staff reviewed placement packages 765-1-35 and 558-2-31 and judged them to be complete; the following documents appeared in the packages as required:

1. Concrete Pre-Placement Checklist Record
2. Concrete Pre-Placement Checklist Record (EBASCO)
3. Daily Concrete Inspection
4. Concrete Curing Data (J. A. Jones)
5. Concrete Placement Inspection
6. Concrete Test Record
7. Concrete Physical Tests
8. Concrete Pour Plan
9. Embed Map Log (if applicable)
10. Cadweld Location (if applicable)
11. Requisition on Warehouse (if applicable)
12. Concrete Mix Delivery Tickets.

The NRC staff also reviewed placement packages 503-9 and 503-10. The packages were complete for items 1 through 8 above; items 9 through 12 were not applicable since they referred to dry packing only.

The NRC staff found that placement package 570-S03-31 did not contain concrete test records. However, discussions with EBASCO personnel indicated that the test records were filed separately by date and crossreferenced to other concrete placement packages. A master test record existed; this was then verified by the NRC staff for placement package 570-S03-31.

The NRC staff review of J. A. Jones concrete placement packages indicated no safety-related problems. However, in order to provide a more generic assessment, the staff reviewed specific NCRs generated as a result of LP&L's 100 percent review after the allegation had been made. Thirty-three NCRs had been generated to define the deficiencies; the summary follows:

1.	Related to Mix Design	7	Note: Each NCR, in general, addresses multiple placement packages.
2.	Personnel Qualifications	16	
3.	Curing Discrepancies	7	
4.	Miscellaneous	3	
	Total	33	

As discussed below, the review of the engineering disposition of NCRs in Categories 1, 3, and 4 did not indicate any impairment of the structural integrity of concrete placements. The NRC staff agrees with the dispositions. The disposition of NCRs filed on missing documents indicated primarily a problem in classifying placements. For example, when a log or record contained information on multiple placements, it was placed in the documentation package of only one of the placements; however, the records were available. A number of Windsor probe tests were conducted when strength test records could not be located or deduced. Some of the mix design deficiencies were also resolved by conducting field tests. The mix designs AAA41D and E were accepted on the basis of a Portland Cement Association report. Also, curing log deficiencies were addressed by examining the weather conditions during the curing period, and by field tests in some cases. The NRC staff review indicated that the concerns raised in the allegation regarding the concrete placement packages were addressed adequately in the disposition of the NCRs.

The part of this allegation concerning uncertified J. A. Jones inspectors is addressed in Allegation A-110.

The NRC staff informed the alleger of the results of LP&L's 100 percent review. Based on the discussion with the alleger, it was the NRC staff's impression that the alleger was primarily concerned with whether the review of the placement packages was completed and whether all the facts related to the actual placements were considered by EBASCO engineering and the NRC.

For the aspects of this allegation related to Cadwelding activities and waterstops, the following allegations should be referred to:

Cadwelding - Missing Documents - A-147;
Uncertified Inspectors - A-110;
Failure to Implement Specifications and Procedures - A-146, A-115;

Waterstops - All Issues - A-129

Regarding the part of this allegation concerning unauthorized changes made to curing records of placement package 593-S01-UZ3ZAA, the NRC staff made the following observations. Two copies of the curing log for placement package 593-S01-UZ3ZAA were found in the records; one of the copies listed three other placements on the record without any appropriate explanations. LP&L found the original curing logs for two of the placements listed in the QA records. For placement package 593-S01-UZ4FHAA, which was also listed on the log, no original curing log was found. Assuming that the same inspector very likely observed curing of the four placements (columns in the fuel handling building) concurrently and that the conditions of the placements were very similar, LP&L decided to substitute the curing log for placement package 593-S01-UZ3ZAA in the QA records of placement package 593-S01-UZ4FHAA. Based on the comparison of three original logs, the curing conditions were found to be very similar.

Further, noting that, for three of the four placements, original logs were located, it was reasonable for the NRC staff to assume that the original curing log for one placement was lost and that no marked differences in curing occurred for the four closely spaced columns. Thus, there did not appear to have been an attempt to manufacture curing records. Based on the explanations provided in LP&L's letter of April 27, 1984, to the NRC, it can be further concluded that, in general, there were no attempts to manufacture curing records. Also, as described earlier, all curing deficiencies were addressed by the NCRs noted above (NCR-3165 addressed the problem discussed above for some other placements).

The NRC staff concluded that the part of this allegation regarding incomplete concrete placement packages and alleged tampering with record was, generally, related to recordkeeping activities. It did not appear that safety significant deficiencies existed in these placement packages . Further, there was no indications that there were significant J. A. Jones deviations from project specifications, although there appeared to be some laxness in recordkeeping and control.

Actions Required: None.

Task: Allegations A-113, A-135, and A-137

Characterization: It is alleged that based on the information presented in an EBASCO memorandum on concrete placement records dated December 9, 1982, a 100 percent review of the concrete placement records should have been started and the problems should have been identified on the nonconformance reports (NCRs). It is further alleged that some items which did not result in NCRs may contain deficiencies reportable to NRC pursuant to 10 CFR 50.55(e).

Assessment of Allegation: The NRC staff reviewed the chronology of events related to the QA reviews on concrete placement and determined that LP&L decided to initiate a review of the concrete placement packages on July 11, 1983, and actually began the review during August 1983. Based on their preliminary findings, LP&L later expanded this review to include all concrete placement records, not just those cited in the memorandum. Thirty-three NCRs were generated by EBASCO to address the deficiencies (no deficiencies were reported on Discrepancy Notices (DNs). These NCRs were also reviewed in accordance with Administrative Site Procedure ASP-IV-122 to determine the reportability of deficiencies to NRC pursuant to 10 CFR 50.55(e). The NRC staff's safety findings based on the review of the above NCRs are discussed in the SSER for Allegation A-112. LP&L also undertook a 100 percent review of Cadweld records, and four NCRs were generated as a result of this review. These NCRs also indicated that the Cadweld records were reviewed for reportability pursuant to 10 CFR 50.55(e). The staff's safety findings are reported in the SSER for Allegations A-110, A-115, A-146, and A-156.

The waterstops and related activities were considered nonsafety-related items as noted in EBASCO memorandum ES-8271-83, dated December 13, 1983. The staff's safety findings with respect to waterstop activities are reported in the SSER for Allegation A-129.

Based on the above information, the NRC staff concluded that LP&L had undertaken activities to review the records as recommended by the alleger, and that the alleger was satisfied that his concerns were fully addressed. LP&L approached this 100 percent review in a time-stepped method which spanned an 8-month period.

The NRC staff also reviewed the allegation against the requirements of 10 CFR 50.55(e) regarding reporting a significant breakdown in any portion of the QA program conducted in accordance with requirements of 10 CFR 50, Appendix B. Based on the detailed review of the various issues involved, the NRC staff determined that there was no need for LP&L to report any of these issues to the NRC under 10 CFR 50.55(e) since nothing had been identified which, had it remained uncorrected, could have adversely affected the safe operation of the plant.

This allegation has neither safety significance nor generic implications.

Actions Required: See Allegations A-110 and A-146.

Task: Allegations A-114, A-144, and A-154

Characterization: It is alleged that the disposition for Nonconformance Report W3-5997 concerning the clam shell filter blanket under the nuclear plant island was not satisfactory.

Assessment of Allegation: EBASCO's disposition for Nonconformance Report W3-5997 was evaluated by the NRC staff and found satisfactory, with the exception of one part of Item IV, "Certification of Personnel." Item IV dealt with an individual who performed inspections without proper certification. EBASCO's response to the nonconformance report was that the personnel cited were qualified when they performed the inspections although employer certification records did not exist. The staff found this response incorrect because one QC inspector from J. A. Jones had no testing or inspection experience prior to coming to Waterford 3 (see Allegation A-110). The other personnel cited had satisfactory credentials and were assessed to be acceptable. The J. A. Jones QA Program Manual stated that training and education requirements were not to be treated as absolute when other factors provided reasonable assurance that a person can competently perform a particular task. In this instance, the manual allowed the experience requirement for one inspector to be waived.

The EBASCO site soils engineer who was at the Waterford site when the clam shell filter was placed had the responsibility for the filter test program and for all subsequent engineering questions relative to construction and engineering activities at the site. The NRC staff review of these activities revealed that the EBASCO site soils engineer was involved in QC inspections at relevant control points for the inspector in question. Accordingly, the staff was confident that the EBASCO site soils engineer would have become aware of construction inspection problems had they occurred and resolved them. This site soils engineer also aided in the disposition of Nonconformance Report W3-5997.

This allegation has neither safety significance nor generic implications.

Actions Required: See Allegation A-110 for actions required.

Task: Allegations A-115 and A-155

Characterization: It is alleged that there were deficiencies in Cadweld splice tensile testing rates when compared to the requirements in the EBASCO Cadweld specification. It is also alleged that the closure of the nonconformance report (NCR) which identified these deficiencies may not be adequate.

Assessment of Allegation: The specific concern stated on the NCR was that, contrary to the requirements of EBASCO Cadweld specification, there were Cadweld splice tensile test failure rates which exceeded 1 in 15 consecutive test samples and no requalification of the Cadwelder was completed. The concern was based on Cadweld splices performed by two Cadwelders.

The Cadweld specification required that, when such a situation occurred, the welding crew was to terminate splicing and be requalified. The specification also required that the production splices on either side of the last failing specimen be cut out and tested and that tests be performed on four more production splices from the balance of the last 100 production splices.

Based on the NRC staff review of NCR-W3-5998 and the two Cadwelders' tensile test records, the observed failure rate for each Cadwelder was no more than 1 in 15 consecutive test samples. NCR-W3-5998 identified the tensile test failure rate pertaining to the total output of all the Cadwelders. There were two permissible options to satisfy the NRC requirement related to a tensile test failure rate of more than 1 in 15. EBASCO selected the option of maintaining records on splice crews, rather than maintaining a composite record across the entire project, as was assumed in the NCR.

Based on the NRC staff review, the resolution of the NCR was correct. The records reviewed by EBASCO were correct and the specification requirement was met with regard to test frequency in the specific splices and Cadwelder requalification. This item has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-116

Characterization: It is alleged that unauthorized changes and additions have been made to J. A. Jones concrete placement records by unknown personnel.

Assessment of Allegation: Actual concrete placement records to which the unauthorized changes and additions were allegedly made were not specifically identified to the NRC staff. Thus, the NRC technical staff addressed this allegation by looking for alterations during the review of records related to other allegations concerning concrete placement records (including Allegations A-129, A-130, A-131, A-140, A-141, A-159, and A-335, which are related to inspector qualifications, unreviewed records, poor placement practices, and records signed off by inspectors on dates when they allegedly were not on site). These allegations have been addressed by the NRC staff as described in this assessment.

The NRC staff reviewed concrete placement records by looking for any unauthorized changes or additions, or falsification of documents. The staff looked for whiteouts on records, documents or portions of document packages that appeared new but that had old dates, errors in dates, duplicate originals, and other indications of falsification or unauthorized alteration.

The review conducted by the NRC staff revealed no obvious unauthorized additions or modifications to J. A. Jones records, even though one apparent falsification was identified in assessing Allegation A-335, where concrete curing records were signed by inspectors on dates when they were apparently not on site. This issue was determined to have no safety significance as described in the assessment of Allegation A-335.

In the absence of more specific information and based on the above action, no items were forwarded to the Office of Investigations for review.

Actions Required: None.

Task: Allegation A-117, A-120

Characterization: The allegations are that Mercury and Tompkins-Beckwith (T-B) records were falsified "to whitewash what may be serious construction defects" and "doctored to give them the appearance of compliance with federal safety regulations."

Assessment of Allegation: The implied significance of the allegations is that if records of safety-related systems have been falsified the quality of those systems are indeterminate.

This issue was addressed by an NRC staff review of the T-B and Mercury document review system and the qualification of record reviewers. The staff also reviewed a sample of documents specifically for unauthorized changes, dates out of sequence, incorrect data, or the appearance of falsification.

The NRC staff found that T-B and Mercury procedures provide guidelines for changes or corrections to documents. Documents were reviewed by subcontractors including T-B and Mercury quality assurance (QA), turned over to EBASCO for an additional review by QAIRG, and then submitted to EBASCO for records storage.

The NRC staff did an extensive review of documents submitted by T-B and Mercury as well as other subcontractors. One possible falsification of a Mercury employee's signature on a nonconformance report (NCR) was observed and was referred to the NRC Office of Investigation (OI) for follow up. No other apparent falsification of records was noted.

The T-B and Mercury record review systems were considered adequate. Personnel performing record reviews are considered qualified. Previous instances of falsified documents were properly corrected by EBASCO (See Allegation A-07). The one possible falsified signature discussed above appeared to be an isolated case. In conclusion, this allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-126, A-291

Characterization: It is alleged that Tompkins-Beckwith (T-B) did not maintain material traceability on the supplemental steel used with pipe hangers and supports. The supplemental steel refers to additional steel used to install pre-fabricated pipe hangers and supports.

Assessment of Allegation: Bergen-Patterson (B-P) furnished pre-fabricated piping supports and hangers. EBASCO furnished the supplemental structural steel for use by T-B during installation of the piping hangers and supports.

The supports and supplemental material were designed to Seismic Category I requirements. 10 CFR 50, Appendix B quality assurance requirements apply. Section VIII of this specification allows identification of an item to be maintained by records traceable to the item. As a result, Certificates of Compliance furnished by the suppliers verified that the material furnished was properly certified in accordance with the applicable ASTM Specifications.

The EBASCO Material Inspection Receiving Report (MIRR) was used to verify that the correct material was received. A Requisition on Warehouse (ROW) was used by T-B to obtain release of the material from EBASCO.

The initial T-B program was established to provide traceability of the paint to be used on the supplemental steel. A material control number was steel stenciled on each item listed on the ROW. If the material was cut into smaller pieces, the number was to be transferred accordingly.

After number stamping, the material was painted by a subcontractor. Different colored paint was used with yellow signifying non-safety non-permanent material. The other colors used designated safety related material.

In 1978, T-B agreed to a contract change with EBASCO to extend the paint material traceability system to also include steel traceability. Because the change came after the original program had been in operation, a number of implementation problems occurred and providing full steel traceability proved difficult.

In late 1983, the contract between EBASCO and T-B was changed to reflect a decision by EBASCO to abandon attempts to provide supplemental structural steel traceability using material control numbers. The supplemental structural steel certification program continued to be in effect as it had been throughout the project.

The alleger based his concern on his knowledge of the material traceability system that was in effect June 1978 to 1984. The system described in the allegation is not representative of the original or final programs. The change back to the original material control system in early 1984 resolves the concern of the alleger. The NRC staff concludes that the support material traceability meets the requirements of 10 CFR 50, Appendix B.

The NRC staff discussed these findings witn the alleger on May 3, 1984. He agreed and expressed satisfaction with the explanation and resolutions of this issue. This allegation has no safety significance nor generic implications.

Actions Required: None.

Task No.: Allegation A-128d, A-212, A-275

Characterization: It was alleged in a newspaper article of January 14, 1984 that there were undersized welds in work performed by the Mercury Construction Company.

Assessment of the Allegation: The NRC staff reviewed records of Mercury activities and learned that undersized welds had been discovered by LP&L in Mercury socket weld fittings. Upon their discovery, LP&L issued Significant Construction Deficiency (SCD) 62, "Undersized welds on ½" schedule 160 pipe." Resolution of this SCD was controlled by EBASCO NCRs W3-4410, Revision 1, W3-4365, and W3-4366.

According to the ASME Code, the size of a weld is determined by the wall thickness of piping or tubing. At locations of low stresses, alternative rules as delineated in Code Case N-316 may be used for reduced weld size. The code case is acceptable to NRC as indicated in Regulatory Guide 1.84. The reason Mercury gave for the deficient welding and inspection was that both were based on criteria for ½" stainless tubing with a thinner wall thickness of 0.065," rather than for the Schedule 160 piping installed, which has a wall thickness of 0.188". A large share of Mercury's work involved the installation of the thinner tubing. The tubing required a 1/8" fillet weld rather than the 1/4" fillet required for schedule 160 pipe. The SCD and NCR's resulted in a reinspection of all welds. Those found to be undersized were rewelded. Those inspected and found to be of satisfactory size were accepted "as is." The rewelds were reinspected by LP&L and found adequate. SCD 62 was reported to the NRC in accordance with 10 CFR 50.55(e) requirements. The NRC staff concurred in the need for SCD 62, but QA controls were adequate to recognize and correct the problem. It may have been a concern at some time prior to the issuance of SCD 62.

In assessing this allegation, the NRC staff visually inspected portions of 20 systems welded by Mercury and found no undersized welds in tubing or support welding. Based on its review of the records and on a visual inspection of accessible portions of 20 systems, the staff believes that the allegation has neither safety significance nor generic implications. The NRC staff has discussed their findings with the alleger and he agreed and expressed satisfaction with the staff's efforts and conclusions.

Action Required: None.

Task: Allegation A-129

Characterization: It is alleged that the installation, inspection, and acceptance of waterstop splicing activities were performed by personnel of the J. A. Jones Construction Company who were not certified for these activities. It is further alleged that the review of the waterstop quality control documentation is incomplete and that those records that were inspected showed failure to implement requirements of specifications and procedures relative to testing frequency, recording of applicable information, and splice location.

Assessment of Allegation: In assessing this allegation, the NRC staff reviewed the Waterford Final Safety Analysis Report (FSAR) which states that to protect against floods all seismic Category I structures, safety-related systems, and components necessary for safe shutdown are to be located within the nuclear plant island structure (NPIS). The NPIS is a reinforced concrete structure designed to minimize water intrusion and the waterstops are one of the design features included for this purpose. The NPIS also has a floor drainage system capable of disposing of water that may be accumulated through leaking cracks in exterior structures, leaking waterstops and surface collection. In addition to the FSAR statements the NRC staff noted in the review that since the early stages of the Waterford project, there has been a listing of items related to the facility which undergo interdisciplinary review for safety classification. This list was first issued in January 1973 and has been under periodic review, resulting in 20 revisions up through March 1984. Waterstops have been noted on the list as non-safety class material. Therefore, although it is desirable to have a high level of quality assurance for the waterstops, a mitigative system for drainage of potential in leakage exists. Accordingly, waterstops are designated as non-safety class material, which EBASCO has confirmed.

The FSAR does not assign a specific safety category to the waterstop. As stated above, the Waterford QA staff considered neither waterstop material nor the installation nuclear safety-related or seismic Class I. The justification for this categorization is that there is no structural function for the waterstop since it is provided only to reduce ground water inleakage to the building through construction joints so as not to add to the water volume to be handled by the radwaste system or present housekeeping problems. Waterstops were, however, shown on a drawing which was designated as Seismic Category I, which apparently has led some to believe all items shown on the drawing are Seismic Category I. This was an error on the drawing. The waterstop material should have been highlighted by a special note on the drawing as not being safety-class material then the confusion would not have arisen during the QA review of documents.

The NRC staff reviewed waterstop records to determine if the installation, testing, and surveillance were performed in accordance with the existing specifications and procedures. In order to perform this review, LP&L was asked to provide waterstop records for the NPIS (which contains all Category I structures where waterstops were used): reactor containment building (RCB); fuel handling building (FHB); and the reactor auxiliary building (RAB). The only records they could produce were for the RAB and the portion of the common foundation mat under the RAB. LP&L could not locate the waterstop splicing records for the RCB, FHB, and other portions of the foundation mat.

The NRC staff review of the records indicated some specific problems of the installation and testing procedures. Some of these specific problems are listed below.

- Some splicers made over ten splices without making a test splice, per requirements.

- In some cases a few of the test splices were not marked off as acceptable. However, cross checking with the waterstop splice tensile test reports showed that these test splices did in fact meet the specifications for strength.

- One inspector who signed off five test splices (this inspector signed off no other test splices or production splices in the records reviewed) was not certified on the date the test splices were signed.

- One of the splices made by a splicer for his certification test did not meet the required tensile properties and the records do not indicate that he was retested.

A large majority of the records the NRC requested could not be provided by LP&L and only the projects own internal procedures required the records since the material is not safety related. The records which were produced showed a small number of minor deficiencies with respect to LP&L's requirements. The deficiencies noted in the records reviewed are not considered significant with regard to plant safety.

A review of 20 basemat preplacement concrete packages, conducted as part of the NRC staff's asssessment of Allegation A-111 confirmed that the waterstops were included in the placements.

Actions Required: None.

Task: Allegation A-132

Characterization: It is alleged that the J. A. Jones Construction Company used a form of communication called "speed letters" to report information that should have been reported in deficiency notices (DNs) and possibly in nonconformance reports (NCRs).

Assessment of Allegation: The implied significance of this allegation is that "speed letters" are not quality assurance (QA) documents and do not receive an EBASCO QA review.

In order to determine the validity and significance of the allegation, the NRC staff reviewed J. A. Jones speed letters numbered 0001 through 1122 covering the period of November 1977 to October 1980. These speed letters had been transmitted to EBASCO engineering personnel and concerned J. A. Jones concrete work performed in the reactor containment building (RCB), reactor auxiliary building (RAB), fuel handling building (FHB), and concrete basemat. The NRC staff also interviewed EBASCO QA and engineering personnel regarding the use of speed letters.

The majority of the J. A. Jones speed letters reviewed by the NRC staff were related to the logistics of work schedules and performance; however, the staff discovered some speed letters involving deviations from, or changes to, the original design specifications. Examples of deviations and field design changes included; a pilaster 5" too high and requiring modification, slight shifting of reinforcing steel locations, and the use of Cadwelding kits on reinforcing steel sizes other than those sizes for which the kit was made. (See the NRC staff's assessment of Allegation A-171).

The NRC staff's interviews with EBASCO QA personnel revealed that the QA personnel were aware of potential problems regarding the misuse of speed letters, and that QA personnel also believed that the Engineering Information Request (EIR) document was possibly being misused. EBASCO QA personnel informed the NRC staff that they were in the process of conducting a review to identify potential problems regarding the use of speed letters and the misuse of EIRs. In a memorandum dated February 20, 1984, the EBASCO QA Site Supervisor requested that the EBASCO Site Support Engineering (ESSE) Supervising Engineer review the J. A. Jones speed letters and EIRs. The results of an ESSE cursory review were themselves presented in a speed letter of January 27, 1984. Another EBASCO speed letter of February 18, 1984, substantiated that design changes had been the subject of some of the J. A. Jones speed letters and EIRs reviewed. Although EBASCO itself had used speed letters instead of the required QA documentation to relay this information, they accurately pointed out that a review of Field Change Requests (FCRs) and Design Change Notifications (DCNs) would have to be performed to determine if the issues presented in the J. A. Jones speed letters were also correctly addressed in the required QA documentation.

The NRC staff review determined that some of the J. A. Jones speed letters and EIRs addressed areas where DNs, NCRs, or FCRs should have been required by the existing QA program, and that EBASCO QA personnel were aware of these discrepancies in the QA practices.

This allegation has no safety significance based on the staff's preliminary findings; however, the generic implications involving the use of documents outside the formal QA program require action by LP&L.

Actions Required: See Item No. 14 of the Enclosure to the letter from D. Eisenhut to J. M. Cain (LP&L), June 13, 1984.

Task: Allegation A-134

Characterization: It has been alleged that there exists a file of letters known as "Nasty Grams" which were prepared by an individual when it was not possible or acceptable to initiate a nonconformance report.

Assessment of Allegation: To assess this issue, the NRC staff reviewed the QC supervisors file. The file contained letters written between the Senior EBASCO QC Supervisor and the QA Manager for J. A. Jones from July 29, 1976, to March 30, 1977. (Most letters were initiated by EBASCO.) Some letters deal with administrative aspects of the QA Program, however, many letters identify problems in the QA Program.

NRC staff evaluated those that deal almost exclusively with problems in the J. A. Jones concrete placement packages. Specific issues included are missing curing records, missing compression test results, missing Cadweld and embedment maps, and missing reinforcing bar test records. There are also a few documents related to deficiencies in QA records for Cadwelds and soils, such as missing splice numbers for Cadweld tests (these are necessary for traceability) and missing dates on backfill location logs.

The existence of the file demonstrates that the QA Program was being audited by EBASCO and that efforts were being made to ensure that documentation of construction was being performed in accordance with the program and procedures in effect. The important issue to be resolved is whether or not the problems identified were corrected, both for the specific items identified, and more generally, in the long term.

The issues of most concern are related to concrete placements performed by J. A. Jones Construction Company. The adequacy of certain concrete placement QA records was addressed, for example, in part, under Allegation A-112. Allegation A-109 also addressing concrete QA records and not contained herein as complete, will be addressed in the future. The issues raised regarding Cadweld splicing and backfilling records that may be significant with respect to safety, and the areas of Cadweld splicing and soils are being more thoroughly assessed under other allegations (A-145, A-146, and A-147).

The staff has concluded, based on its review, that this file does not include any new issues not already being addressed under other allegations. Therefore, information obtained from the file was included in the review of other appropriate allegations and resolution of those allegations will resolve the issue of this file and any related safety issues.

Actions Required: None.

Task: Allegation A-136

Characterization: The allegation is that it was difficult for EBASCO quality assurance (QA) personnel to get approval to initiate a formal nonconformance report between 1975 and 1977 in the civil-structural area.

Assessment of Allegation: The NRC staff reviewed the procedure for civil-structural nonconformances between 1975-1977. The EBASCO procedure required a nonconformance report (NCR) when, for example, there were physical defects, test failures, incorrect documentation, or deviations from prescribed inspection or test procedures. An NCR was usually created from upgrading a discrepancy notice (DN). Unlike a DN, the NCR required a separate evaluation by a QA engineer to ascertain if it should be upgraded to a reportable item under 10 CFR 50.55(e). The alleger stated that, in the early days of construction, QA reviewers were discouraged from writing NCRs to avoid further independent evaluation of discrepancies or safety violations.

The NRC staff reviewed the allegation and found the following:

1. The EBASCO procedure for writing NCRs has been in existence since September 1975. The first DN was generated in October 1975 by EBASCO civil-structural QA personnel. Therefore, the procedure was available by the time the first DN was written. NCRs were also written in 1975 and 1976, for example, on concrete work associated with the basemat.

2. LP&L has re-evaluated all the concrete packages, soils packages, and structural steel construction packages and found that there is no significant violation of procedures and construction requirements. The NRC staff found no issues in the civil-structural discipline during this period which clearly indicated an NCR should have been written but was not.

3. The NRC staff reviewed sample DNs written between 1975 and 1977 and found none that addressed significant safety issues which were not upgraded to NCRs.

Based on the staff's review of typical DNs and NCRs written in the civil-structural discipline in the 1975-1977 time frame, it appeared that all significant issues were considered against the in-place QA procedures. The difficulty of initiating an NCR was not directly assessed, since the emphasis was to determine if unresolved safety issues exist. Allegation A-49, A-53, and A-283 address the issue of individuals not being free to write NCR's.

This item had no direct safety significance and there were no facts to suggest a generic problem.

Actions Required: None.

Task: Allegations A-138 and A-159

Characterization: It is alleged that the review of the soils packages conducted by the Quality Assurance Installation Review Group (QAIRG) revealed several deficiencies during the review of approximately the first four feet of backfill; the work was then stopped before completion.

Assessment of Allegation: The NRC staff review of the backfill records revealed that the backfill operation was divided into seven placement fills surrounding the foundation walls. The in-place soil density was required to be tested in accordance with ASTM-D-1556, ASTM-D2167, ASTM-D2922 or any other method suitable to ensure that the backfill has been properly compacted. One test with an in-place relative density of at least 75 percent was required to be made in each layer for every 20,000 square feet placed in one day.

The EBASCO soils inspector conducted a final review of 100 percent of the soils packages for completeness and conducted a partial, random-sample review of the packages for technical accuracy. He stated that he did not find or identify any technical problems or missing records. The NRC staff conducted a review of the in-place density tests for a sample of the total soils packages for the seven fill areas. The NRC staff found that some of the in-place density test reports were located in the wrong soils package. The following table summarizes the results of the reviews:

	Fill #1	Fill #2	Fill #3	Fill #4	Fill #7
No. of Test Sample Reports Reviewed	33	29	52	59	55
Documents Filed in Wrong Package	0	1	5	0	1

The NRC staff also reviewed the records for the in-place testing frequency of each layer of backfill that was placed and compacted around the foundation structure. This review revealed that there was no documentation covering either the first three feet of backfill in fill area #7 or the first 5 feet of backfill in fill area #5. The in-place density tests for fill area #7 were found at the GEO Office (test lab), but no record of inspection was found for the first three feet of fill area #7.

The NRC review of a sample of the soils packages indicated that the final review conducted by EBASCO was incomplete. The records for fill area #7 were in the GEO Office, but showed no indications of review, nor could records be found for the first 5 feet of fill area #5. The soils packages were not all reviewed by the staff for technical accuracy because deficiencies found during this review should have been discovered during EBASCO's final review. The EBASCO reviewer of these soils packages was involved as a soils QC Inspector almost from the beginning of the backfill operation to its conclusion. Based on this fact, the NRC staff concludes that although he was qualified to conduct a records review, he could not perform an unbiased review of the records because of his close involvement with the backfill operation.

The safety significance of this item is that some fill areas are in question as to the placing and compaction of the backfill because of the missing documents. The indication that inadequate attention was given to the compilation of quality records and to conducting satisfactory record reviews will be addressed by LP&L.

Actions Required: See Item 7 in the enclosure to the D. Eisenhut letter of June 13, 1984, to J. M. Cain (LP&L).

Task: Allegation A-139, A-140

Characterization: It is alleged that a review of the placement records for the concrete basemat indicates instances of poor concrete placement practices during construction of the basemat that were in violation of the specification and the American Concrete Institute (ACI) standards, and that these poor placement practices led to the cracks found in 1983.

Assessment of Allegation: The nuclear plant island structure (NPIS) housing all the seismic Category I structures is supported on a continuous reinforced concrete foundation basemat 270 feet wide, 380 feet long and 12 feet thick. The basemat was constructed in 28 concrete placements. Section 3.8.3.2 of the Waterford Final Safety Analysis Report (FSAR) references ACI Standard 301, Specification for Structural Concrete for Buildings, as a main construction standard. The Project Specification LOU-1564-472, Concrete Masonry, embodies the project concrete construction procedures.

To assess the allegation, the NRC staff reviewed 20 of the placement documentation record packages, Stop Work Order (SWO) No. 1, Deficiency Reports (DRs), Deficiency Notices (DNs), Nonconformance Reports (NCRs), surveillance reports, Project Specification LOU-1564-472, applicable J. A. Jones and EBASCO work procedures, and construction photographs and drawings. The NRC staff also conducted several walkdowns to observe cracks in the basemat.

The NRC staff review of the placement record packages revealed that approximately 106 NCRs, 46 DNs, and 42 DRs were related to the basemat. The following recurring problems were found:

- Excessive movement of concrete
- Inadequate vibration
- Excessive lift height
- Concrete dropped greater than five feet
- Inadequate testing frequency
- Inadequate curing logs, and
- Out-of-tolerance concrete test results (air content, slump, mixing time, mixer revolutions, volume of water added).

Daily inspection records indicate that corrective actions were taken as soon as some of these conditions were noted. The NRC staff review of the NCRs generated to address the last item indicated that the concrete batches which did not meet the air content and slump requirements were rejected as soon as the test results were known. However, a few yards of concrete were placed prior to the discovery of deficiencies. These small quantities of concrete did not have any impact on concrete strength because the average strength of all the concrete placements was recorded to be about 5,300 psi, approximately 32 percent over the required design strength of 4,000 psi.

Alleged curing deficiencies, for example, were found in that the curing inspection logs did not contain information on curing conditions during weekends. This deficiency was addressed by examining the weather data for the days when the curing conditions were not recorded, and by the Windsor-probe tests for some placements (other than for the basemat) to assure that the in-place strengths were not affected. From the NRC staff review of these data, it is apparent that this record-keeping problem had no impact on the structural integrity of the basemat.

Considering the construction technique and the large volume of the concrete free of the reinforcement congestion and open reinforcing spacing, the instances of poor vibration and excessive lift heights would not be likely to produce inadequate consolidation or any significant voids. Construction drawings and construction photos examined by the NRC staff indicate very clearly the lack of reinforcing congestion and the ease of accessibility for the crews and equipment. The lack of significant voids is also evident from an examination of the drilled cores from the placement of Block 10B. The cores taken from the center portion of Block 10B do not indicate any voids as a result of inadequate consolidation. (The average strength of the cores was 6,150 psi at 32 days.) The poor consolidation discovered was found near water stops and the key-ways, which were located next to the formed vertical faces of the blocks. The records for placements indicate that these voids were discovered and were repaired right after the placement.

The NRC staff review of SWO No. 1 (issued after the first three blocks were placed) and surveillance reports also indicate that LP&L made attempts to assure that deficiencies were corrected and concrete was placed in accordance with the project purchase specification. The NRC staff believes LP&L was successful in achieving a quality product in the basemat construction.

EBASCO NCR W3-6212, which addressed basemat cracks identified in the summer of 1983, did not characterize the cause of the cracking. The cracks were described as "widespread hairline cracking." The disposition included consideration of two issues: stability of the containment vessel and long-term corrosion, both of which were discussed in memoranda from 1977, when the first cracking was noted (NCR W3-535). Another EBASCO letter, dated July 27, 1977, which was not part of either NCR, gives as a possible cause of the cracking "the results of the concave shape (high at the containment) which the mat has assumed due to differential settlement."

Based on the above review, the NRC staff concludes that in spite of the occasional violations of ACI standards, the construction of the concrete basemat has met the intent of the project specifications and the FSAR criteria. The cracks are not the result of observed and recorded deficiencies during concrete placement operations although the thermal effect during the normal temperature-buildup from the heat of hydration is believed to probably have created tensile cracking. The staff further concludes that the quality of the basemat has not been impaired, as shown by the average strength of the field cured test cylinders.

During the NRC staff walkdown of the basemat, it was noted that there was water standing inside a vertical electrical conduit some 4 feet above the floor elevation at the -35 feet level. This conduit is located in a corridor along

the south wall of the emergency feedwater pump room for the A-train in the auxiliary building. The conduit runs verticially up from the basemat and provides the pathway for the leads to a terminal box for instrumentation connections to the piezometers and other foundation monitoring equipment used during construction. LP&L was unable to provide drawings to show the installation details, but the NRC staff believes that the source of the standing water is the same as that which has appeared in the area of the basemat seepage zones, namely groundwater.

Actions Required: See Item 19 of the enclosure to the letter from D. Eisenhut to J. M. Cain (LP&L), June 13, 1984.

Task: Allegation A-141

Characterization: It is alleged that EBASCO discrepancy notices (DNs) written during a review of 70 out of 1200 J. A. Jones concrete placement packages were listed on a log, and that the log was required to be maintained by EBASCO instruction QA 9-IA. The alleger expressed concern as to whether these DNs were considered in the quality assurance (QA) review of the concrete placement packages.

Assessment of Allegation: At the end of field work on May 25, 1984 the NRC staff had not located or identified any of the 70 concrete placement packages. On August 10, 1984 some material related to the QAIRG work was located but the information has not been reviewed. This allegation will have to be addressed in the future.

Actions Required: Unknown at this time.

Task: Allegation A-142

Characterization: The alleger has stated very clearly on several occasions that the nonconformance report (NCR) which he personally initiated has been adequately dispositioned. No allegation is contained in this reference.

Assessment of Allegation: American Bridge (AB) was the primary constructor for structural steel fabrication and erection. It was stated by the alleger that AB had failed to provide any documentation for over 30 percent of their work and, of the work that was documented, roughly 30 percent of the documentation did not reflect true status.

The alleger indicated that his quality records review group discovered this problem and wrote a lengthy NCR on the discrepancies. The alleger was involved in the resolution of this NCR and was in agreement with the results; he had no further concerns.

However, the alleger referred to an article in Gambit (December 10-16, 1983), a weekly newspaper in the New Orleans area, in which the discrepancies found by the alleger's quality records review group were characterized as the basis for other, possibly generic problems with subcontracted work.

The NRC staff is currently assessing other NCRs involving subcontractor performance. (See Allegation A-33.) Therefore, the generic implications of this issue will have to await the outcome of the staff's assessment. At the present time, this issue has no safety significance.

Actions Required: None.

Task: Allegation A-143, A-150, A-162, A-163

Characterization: The allegation is that LP&L, EBASCO, and contractors did not perform adequate reviews of QA records.

Assessment of Allegation: Inadequate review of documentation to assure completeness and technical adequacy of QA records could cause the quality of installation work to be in question.

The procedures delineating guidelines for the collection, handling, and review of construction-installation quality assurance (QA) records for NISCO, Mercury, Tompkins-Bechwith (T-B), EBASCO, and LP&L have been evaluated by the NRC staff for compliance with ANSI N45.2.9 and ASME requirements, and found acceptable.

To verify procedural implementation, the NRC staff reviewed a random sample of work packages for each company. The startup systems (SUS) sampled included 36-Component Cooling, 52-Reactor Cooling, and 60-Safety Injection. The hardware reviewed included large and small-bore piping, and instrumentation and control lines.

The NRC staff reviewed the documentation packages to verify completeness, accuracy of content, proper form, traceability, legibility, authenticity, and pertinent changes. The Staff also conducted system walkdowns.

The NRC staff made the following observations:

(1) QA records review, acceptance and approval was adequately documented (stamping, signature, and dating).
(2) Technical adequacy was acceptable.
(3) Records were complete.
(4) Corrections were performed in accordance with prescribed procedures.
(5) Record retrievability was timely.
(6) Auditability was adequate.

For additional information regarding QA record review by contractors, EBASCO and LP&L, see Allegations A-35 and A-308. Technical records review versus records accountability is addressed in Allegation A-186(b).

The NRC staff concludes that the contractors, EBASCO, and LP&L have implemented adequate documentation requirements, including reviews. Therefore, Allegations A-143, A-150, A-162, and A-163 have no safety significance, nor generic implications.

Actions Required: None.

Task: Allegation A-145

Characterization: It is alleged that the location plots for some of the in-place density tests for soil backfill did not fall within the fill area that was identified on the test report.

Assessment of Allegation: The NRC staff conducted a review of a sample of the in-place density tests for soils packages for the seven fill areas. The NRC discovered during the review of five of the seven fill areas that the location of the in-place density test noted on the test report did not always fall within the fill area that was stated on the test report. Additionally, it was found that some of the in-place density test reports were located in the wrong soils package. The following table summarizes the results of that review:

	Fill #1	Fill #2	Fill #3	Fill #4	Fill #7
Number of Test Sample Reports Reviewed	33	29	52	59	55
Incorrect Test Location on Test Sample Report	6	21	0	2	10

While it appears that there were errors in recording test locations, there is no safety significance to this item in that the in-place densities which were determined by the tests show adequate results and the NRC staff believes the distribution of the tests was adequate. Generically, these discrepancies indicate that inadequate attention may have been given to maintaining quality records.

Action Required: See Item No. 7 of the enclosure to the letter from D. Eisenhut to J. M. Cain (LP&L), dated June 13, 1984.

Task: Allegation A-146 and A-157

Characterization: It is alleged that deficiencies in Cadweld splicing records identified in nonconformance report (NCR) W3-6234 have not been properly dispositioned.

Assessment of Allegation: The NRC staff review of this matter indicated that as a result of concerns raised during the construction appraisal team (CAT) inspection in February and March of 1984, LP&L had reopened this report (NCR). The NCR was originally initiated on May 16, 1983 and contained several issues pertaining to Cadweld record deficiencies, uncertified Cadweld inspectors, and the implementation of Cadweld sampling procedures. The staff assessment of each item addressed in the NCR is as follows:

1. During the quality assurance (QA) record review, EBASCO identified 90 Cadwelds with incomplete records which had been removed for testing or which were visually rejected. The replacement splice numbers for these 90 had not been recorded in the comments column of the daily Cadweld inspection report (DCIR), as required by J. A. Jones procedure W-SITP-4. The alleger was apparently concerned as to whether the replacement Cadwelds were actually installed in facility concrete structures.

   EBASCO researched the Cadweld records and verified that information provided in the QA records for preplacement inspection and release for concrete placement indicated that installation of 85 out of the 90 Cadwelds in question had been documented on the preplacement inspection data forms and that the Cadwelds passed visual inspection. The relevant Cadweld maps indicated that the remaining five, which had apparently been designated for cut out, had replacement splices installed. Based on this information, the NRC staff believes that the Cadwelds removed for testing or as visual rejects were replaced.

   The NRC staff also reviewed the procedure used to verify the status of a Cadweld. A color coding system was used to designate splices to be accepted, those to be tested, and those to be rejected. Maps were also made which generally reflected the location of all splices. The NRC staff found no indications of missing splices.

2. This portion of the NCR addressed certification of J. A. Jones splice inspection personnel. (This issue is assessed in detail in Allegation A-110).

3. This portion of the NCR identified 43 Cadwelds that did not receive a final visual inspection by J. A. Jones inspectors. The NRC staff reviewed Attachment III to NCR W3-6234 and noted that 41 of the 43 Cadweld splices were production or sister splices that had been tensile tested and had met the minimum tensile strength requirement. The other two Cadwelds were installed in the containment shield building without having received final visual inspection by a certified inspector and were not removed for tensile testing. The final inspection of these two splices was made by a trainee with 6 months experience who had conducted 504 presplice and postsplice inspections with no discrepancies.

Based on these findings, the NRC staff concluded that the structural capability of the two Cadwelds was adequate, and that even though they were not visually inspected by a certified Level I inspector, there is no reason to question their adequacy. The fact that they did not receive a final visual inspection does, however, indicate that EBASCO procedures were not being followed in all cases. Nevertheless, the NRC staff believes that these two splices do not represent a reduction in structural capability.

4. This portion of the NCR discusses the numerous Cadwelds that did not receive a final visual inspection by EBASCO personnel as required by the specification. The NRC staff reviewed the daily Cadweld inspection reports and verified that these Cadwelds had received final visual inspection by certified J. A. Jones inspectors. These daily Cadweld inspection reports were also reviewed by EBASCO QA personnel and found to be acceptable. Based on EBASCO review of a concrete preplacement checklist, all the Cadwelds in question were accepted for concrete placement. The NRC staff agreed with the acceptance of these Cadwelds. The NRC staff believes that while deviations in the specified inspection procedures occurred, there is no indication that the quality of the specific Cadwelds was impaired by not having had another level of inspection at the final stage by EBASCO.

5. Three specific areas were addressed in this section of the NCR: (a) the required sampling procedures following visual rejection of a Cadweld, (b) the use of sister splices to allow splicers to remain qualified for the three months when they were not active in production splicing, and (c) the adequacy of the overall sampling program implemented for specific structures.

   The NRC staff reviewed disposition of the concern that sampling frequency of Cadwelds for tensile testing was not resumed for all positions and bar sizes after a Cadweld was visually rejected. The requirement to resume tensile test sampling for all bar sizes and positions was imposed by an EBASCO specification and not by an NRC Regulatory Guide or an industry standard. The EBASCO specification further states that the splicing crew should be requalified should two visual rejects occur in 15 consecutive splices. The NRC staff position regarding these issues is that a splice visually rejected should be replaced, but that no resumption of the tensile test sampling plan or requalification of splicers was required as a result of a visual reject unless there are repeated visual rejects.

   Based on its review, the NRC staff concluded that the basis for the closure of the NCR was not adequate with respect to the EBASCO specification because the data presented in the NCR was not sufficient to determine if the tensile test sampling frequency was resumed after each visual reject. However, the staff also concluded that even if the sampling plan was not resumed, there would be no NRC safety concern. Regarding the issue of corrective action for rejected splices, a review of the records indicated that the rejection rate apparently never exceeded 1 in 15, and was generally much lower. Thus, corrective action was never required. The NRC staff believes that the data on this concern should be reviewed relative to the EBASCO specification.

The NRC staff also reviewed the concern over whether Cadwelders should use sister splices to remain qualified when they had done no production work for 3 months. The NRC staff does not disagree with this practice or with the disposition of the item by EBASCO.

The NRC staff attempted to review the Cadweld sampling program as applied to specific structures or structural elements, but the data have not been assembled as yet in this manner. Therefore, the sampling frequency required by the specification, as well as LP&L's commitments to comply with the guidelines in Regulatory Guide 1.10, were not verified as having been met.

6. This portion of the NCR discusses the fact that during the EBASCO QA records review, they found that some Cadwelds either were not addressed on a daily Cadweld inspection report or were not recorded on the Cadweld maps. The NRC staff was informed that subsequent to a sample QA review performed by the EBASCO Quality Assurance Installation Review Group, a review of all J. A. Jones Cadweld records was completed which estimated that 14,685 Cadwelds were installed. Of these, 39 had records to indicate that they were installed, although their exact location along the reinforcing bar could not be identified. Information contained in the concrete preplacement lists verified that all 39 Cadwelds were installed, inspected, and accepted in the concrete placement. This was judged to be acceptable to the NRC staff since the exact location of a splice is generally required only until it has been determined the splices have all met the strength requirements based on the samples tested. Nevertheless, knowing the location of each Cadweld would aid if its removal became necessary.

   Only 6 of the 14,685 Cadwelds on the Cadweld map were found not to have daily Cadweld inspection reports. All 6 Cadwelds were located in the structures inside the reactor containment building. The NRC staff review of the Cadweld records and test results indicated that only 263 of 14,685 Cadwelds were visually rejected. At this rejection rate, probably none of the six would have been rejected. Moreover, the six are distributed throughout the interior structures and even if defective, would not contribute to any significant understrength. If one had been a visual reject, test data indicate that even if an area twice as large as that used to reject splices was present, the splice would still have met the tensile test strength criterion.

Actions Required: See Item No. 11 in the Enclosure to the letter from D. Eisenhut to J. M. Cain (LP&L), dated June 13, 1984.

Task: Allegation A-147

Characterization: It is alleged that Cadweld test reports were "created" to replace lost records. This is indicationsd by signatures or initials on Cadweld tensile test reports being noticeably different for the same technician.

Assessment of Allegation: During EBASCO's quality assurance (QA) review of Cadweld records it was found that some of the Cadweld tensile test reports at the end of 1975 and the beginning of 1976 existed in duplicate but had signatures or initials which were noticeably different. There was concern that some of the original reports might have been missing and that reports had been manufactured to replace the missing records. Later the missing reports were found, resulting in nearly identical records.

The NRC staff reviewed EBASCO Nonconformance Report (NCR) W3-7481 and its disposition. The staff noted that during the initial construction period at Waterford, there were three companies involved with installation and inspection of Cadwelds. J. A. Jones was responsible for installing and cutting out Cadweld samples identified for testing; EBASCO was responsible for sending the test samples to GEO (the testing laboratory) and for evaluating test results; and GEO was responsible for performing the tensile tests, recording the test results, and forwarding them to EBASCO. After the samples were tested at GEO, the test data, including the technician's initials, were recorded in ink in a bound log book. GEO personnel then transferred the necessary data to the appropriate form, in this case Form QC-15 (July 22, 1975). A copy of this form was maintained in the GEO files, and the original was sent to EBASCO for evaluation against the acceptance criteria.

Employees interviewed by the NRC staff said that in certain situations EBASCO found that just before placement of concrete, some of the tensile test reports had been either mishandled or lost, and that duplicate reports had been constructed. The test data and the lab technician's name or initials were purportedly retrieved from GEO's file at that time. EBASCO QA personnel apparently utilized this retrieval process to expedite the placement of concrete.

The NRC staff learned that at some time later in the construction phase the copies of the original reports were found. J. A. Jones submitted them to EBASCO, which in turn submitted the reports back to J. A. Jones for inclusion into their files. This practice resulted in approximately 70 to 90 incidents of two nearly identical reports existing in the file; these identical reports related to the same tested Cadweld sample, but had noticeably different signatures or initials for the same technician.

The NRC staff reviewed the Cadweld records in question and examined both the copies of the original and the reconstructed test reports, as identified in the NCR. The staff found no technical data which was different than that noted to be original test data. LP&L had dispositioned the NCR by identifying both the original test reports and the reconstructed reports. The NRC staff referred to the original GEO log book and checked the entries for some sample tests, which indicated that the test data (tensile failure load of specimens) were consistent with the reports.

The NRC staff found no "created" test reports from the standpoint of test data and finds LP&L's disposition of the NCR to be acceptable. The staff believes, however, that duplicate second reports may have existed which contained initials not made by the actual reviewers.

Based on the NRC staff's review of existing technical data, the staff concludes that the test records represent the actual load carried by each test specimen, and that no test reports were "created" to replace lost records. This allegation has no safety significance.

Actions Required: None.

Task: Allegations A-149; A-151; A-152; and A-153

Characterization: The allegation is that four nonconformance reports (NCRs) were signed by QC inspectors performing work prior to their being certified. It is further alleged that one NCR shows a lack of inspection reports for installation of seismic Category I stairs.

Assessment of Allegation: In a review of records for this allegation, the NRC staff identified seven NCRs in an EBASCO QAIRG letter that contained deficiencies that were undetected in previous record reviews. Four of these NCRs (W3-5563, W3-5564, W3-5565 and W3-5973) were the ones alleged to contain inspections performed by J. A. Jones QC inspectors prior to their certifications. The other three were addressed in Allegation A-416. These NCRs were reviewed to answer any deficiency and to evaluate the disposition and corrective action required should the allegation prove true. Review of the EBASCO QC inspectors certifications were also performed to assure qualification of the applicable inspecting personnel.

NCR W3-5563, dated January 24, 1983, involved bolting on the bridge crane of the fuel handling building (FHB). It was signed-off by a J. A. Jones Construction Company trainee prior to that person's certification as a Level I inspector. Attachments to NCR W3-5563 indicated that the trainee inspected the work on August 27 and 28, 1979, and on November 6, 1979. The individual in question was certified as a trainee on July 9, 1979, and certified as a Level I inspector on November 7, 1979. Original bolting deficiencies were documented in an NCR in 1979. The bolting inspection was originally signed off in the presence of a Level II inspector, who countersigned the inspection reports on February 4, 1983.

The recommended disposition was signed on January 31, 1983, and corrective action was completed in accordance with recommended disposition and signed off on February 4, 1983.

The corrective action taken was not appropriate. Reinspection should have been performed by a certified inspector and properly signed-off by EBASCO QC. The incident was reported to NRC as PRI Report 111, and later designated as SCD 78.

NCR W3-5564, dated January 24, 1983, involved lack of records to verify the inspection of bolting and welding by J. A. Jones on Seismic Category I stairs between elevations -34.75 and -8.0' in the Fuel Handling Building.

The recommended disposition included inspection of welds and bolted connections by EBASCO QC. The disposition was signed on February 2, 1983, and revised on March 15, 1983, since the inspection revealed that several of the bolted connections were loose and that "in most of the connections, the bolts had not been tightened sufficiently to bring the mating surfaces in full contact."

All bolting was completed and inspected on September 23, 1983. Welding repairs for four welds were completed and inspected on July 26, 1983. The NCR was signed off by the QAE on November 7, 1983. Dispositioning of the NCR was not acceptable in regard to inspection of welds without removing the paint. The paint precludes adequate visual inspection of the welds.

The NRC staff also checked the deficiency for reportability in regard to 10 CFR 50.55(e). The stairs were determined to be in an area where they could not affect safety-related structures, systems, or components if they failed and therefore this deficiency was not reportable for defects.

NCR W3-5565, dated January 24, 1983, involves witnessing and acceptance of reeving of the FHB bridge crane by a QC inspector trainee who was not certified as a Level I inspector at the time of inspection.

The QC inspector was certified as a trainee for Structural and Reinforcing Steel on July 9, 1979, and for Level I, Concrete, Structural and Reinforcing Steel, on November 7, 1979. Inspections were performed on August 15, 17, 20, 21, and 22, 1979.

The recommended disposition was for EBASCO QC to reinspect the work by a certified inspector and process the required documentation.

The manufacturer adjusted, checked, and tested the crane during January 1983. The certification was signed off by a start up engineer on January 24, 1983 (late entry on warning bell made February 1983). Although the staff reviewed the start up engineer's certification and found it adequate, the inspection performed by the QC inspector was not in the file. Final corrective action was concluded and signed off by the QAE on July 11, 1983. The deficiency was reported to the NRC as PRI-111 (later designated as SCD-78).

NCR W3-5973, dated March 28, 1983, involved the welding inspection of a FHB tornado door frame which was performed by an inspector prior to his being certified as a QC inspector, Structural/Reinforcing Steel Level I or a Visual Inspector. He was certified as a Level I, Structural/Reinforcing Steel on August 24, 1977, and Visual Inspector on October 18, 1977. The inspection was made during the period August 3, 1977, through October 14, 1977. Also, there were no inspection reports for weld repairs made on welds on the door frame. The weld repairs were a result of work done to plumb the door frame as documented in an NCR in 1977.

The recommended disposition was to reinspect the weld areas and document the results. If repairs were required, they were to be made in accordance with applicable procedures and reinspected. Since no weld repairs were required, the final corrective action was "use-as-is."

Review of the certifications of the responsible inspectors showed no deficiencies other than those above.

The NRC staff's review of this issue indicated that the allegation is valid regarding inspection by personnel prior to their certification, and incomplete records identified in these NCRs, but the deficiencies noted in the records reviewed will not affect plant safety. Evaluation/inspection of the issues identified no hardware problems, except for NCR W3-5564, where it was found that a set of FHB stairs had several bolting connections which were loose, and that in most connections the bolts had not been tightened to bring the mating surfaces in full contact. Inspection of the stairs showed that they were not located in an area where their failure would have caused damage to safety-related

equipment. The records reviewers had considered the generic aspects of inspector certification. The reviewers pointed out discrepancies in regard to inspector certification and incomplete or missing records. The NRC staff concludes that this allegation has no safety significance or generic implications.

Actions Required: See Item No. 6 in the Enclosure to the D. Eisenhut letter to J. M. Cain (LP&L), of June 13, 1984.

Task: Allegation A-156, A-106, A-108, A-133

Characterization: It has been alleged that J. A. Jones Daily Cadweld Inspection Reports contained inspectors' signatures or initials that were noticeably different. There was a concern that these were forged signatures and initials, leaving the authenticity of these records in question.

Assessment of Allegation: The NRC staff reviewed Nonconformance Report (NCR) W3-6245 which was issued on May 20, 1983, to address discrepancies with the signatures and initials in the Cadweld records. One of the NCR attachments included the records which have the questionable initials. The authenticity of the signatures of five inspectors was under question and is being addressed by the NRC Office of Investigation.

In the initial technical disposition of this NCR, LP&L reviewed the concrete preplacement checklist records and Cadweld location maps to assure that the Cadwelds were installed and inspected as required. The authenticity of the signatures on these records was not questioned or examined at that time. It should be noted that the "Cadweld mapping" according to the project procedure, was used to record verification of the location of each splice, verification of the sizes of the splice bars, and verification of Cadweld identification number (ID), position and splice data.

LP&L, in further attempts to clarify the reasons for occurrences such as discrepant initials, obtained signed statements in January 1984 from the involved inspectors. These statements provided explanations for the appearance of the initials. It appeared that either the original reports were soiled in the field or the inspectors were in a physically awkward inspection position and called out data which was recorded and initialled by a second inspector. The inspectors stated that, when they entered the information onto the Cadweld map, they had to look at each Cadweld number stenciled on the Cadweld sleeve.

These numbers were readily discernible, and acceptable Cadwelds were painted white. The rejected Cadweld sleeves were painted red, while sample Cadwelds selected for testing were painted yellow. Since each Cadweld had to be examined for Cadweld mapping, the color coding scheme made it very unlikely that an unacceptable Cadweld would be left in place.

Based on the NRC staff's evaluation of the disposition of NCR W3-6245 and examination of the concrete preplacement checklist records, the staff believes that the questionable Cadwelds were actually installed and inspected and that no reject or test splices required for testing were left in a placement. The integrity of structures was not in question. The indications were that this was a general practice in the Cadweld splicing area but was assessed as having no safety significance.

It should be noted that the alleger had not questioned the acceptability of the Cadwelds. In a discussion with the staff, the alleger indicated that he was more concerned about the authenticity of the signatures on the inspection forms.

This allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegations A-158 and 272

Characterization: In an internal EBASCO memorandum dated June 9, 1983, concerns were raised regarding J. A. Jones Construction Company quality assurance/quality control (QA/QC) documention. The following four areas were identified as areas of concern:

1. The lack of certification of EBASCO quality control (QC) inspectors responsible for monitoring the installation of safety-related work by J. A. Jones.

2. The absence on records of the identification of an authorized individual and a date when records were supplemented or corrections made.

3. Noticeable differences in several signatures or initials on the daily Cadweld inspection reports as recorded in Nonconformance Report (NCR) No. W3-6245.

4. A majority of the Cadweld records lacked the initials, date, and stamp of the QA reviewer.

It is alleged based on the above, that the scope of the QA review should have been expanded.

Assessment of Allegation: LP&L, as a result of a September 21, 1983, memorandum (File Reference W3 - QA-26572), undertook a 100 percent review of the concrete placement packages. This included J. A. Jones QA/QC documentation. As a result of this review thirty-three NCRs, each addressing multiple placements, were generated to address the deficiencies. LP&L also performed a 100% review of soils packages for completeness with 50% review for technical accuracy (see Allegation A-138/159).

Based on its review, the NRC staff concluded that the expanded review of quality records performed by LP&L was adequate. Although some records were determined to be missing or incomplete, the extent was determined not to be significant. Consequently, the allegation has no safety significance and its generic implications are addressed in the other referenced allegations.

The NRC staff conducted an inspection of each of the four areas of concern, mentioned in the EBASCO internal memorandum. The findings of this inspection effort are documented in the SSER sections for the following allegations:

1. Allegation A-110.

2. Allegation A-112.

3. Allegation A-156.

4. No specific review was conducted by the NRC staff in connection with this concern; however, the NRC staff has conducted an overall safety review of Cadwelding. (See SSER of Allegation A-146.)

The safety impact, generic implications, and the staff's conclusions are detailed in the SSER of each of the above SSER sections.

Actions Required: See specific SSER sections referenced.

Task: Allegation A-160 and A-161

Characterization: It is alleged that support structures for instrumentation cabinets mounted on grating inside the reactor containment building (RCB) were fabricated with materials which lack heat number traceability; that the weld rods used on these supports are not traceable; and that welding on the instrumentation cabinet supports was performed by unqualified welders and inspected by an uncertified inspector.

Assessment of Allegation: In examining the allegation concerning instrument cabinet supports, the NRC staff reviewed copies of requisition on warehouse (ROW) forms which tie directly to material receiving inspection reports (MRR). From the MRRs, the purchase order was identified. These records allowed the material used in the instrumentation cabinet supports to be traced. Further, all support steel for the instrument cabinets was purchased as safety-related. This item has neither safety significance nor generic implications.

Review of the allegation that the weld rods used on instrument cabinet supports were not traceable indicated that inspection reports listed the heat number or the lot number of the weld rods used so that weld rods were indeed traceable. This item has neither safety significance nor generic implications.

The NRC staff reviewed the allegation that welding on structural supports for instrumentation cabinets inside the RCB was performed by unqualified welders. NCR W3-7549 was written after the allegation and documents an example of the issue in concern where LP&L's review has identified issues. The NRC staff reviewed qualifications for all welders who worked on the instrumentation cabinet supports.

The NCR indicated that two welders performed work in welding positions for which they were not qualified. LP&L is committed to American Welding Society (AWS) D1.1-1972 for welder qualification. A review of inspection reports indicated that only one welder may have been unqualified.

A review of the quality control (QC) inspection records indicated that on many supports there were more than two welders performing work. The records indicated that the welder was qualified for the welding he was performing by QC checking "satisfactory" in the welder qualification check box. There was an inspection report for each welder, but the exact weld location where each welder worked was not identified. EBASCO records review group stated that all J. A. Jones Construction Company's documentation may still not be completely assembled. They strongly believe there is documentation that proved that the welding on the instrument cabinet supports was performed by welders working in positions for which they were qualified.

A QC inspector from J. A. Jones stated that it was very common for one welder to work only on the portion or position of a structural member for which he was qualified and that another welder would complete other portions of the weld for which he was qualified.

A review of this issue indicated that welding on the instrumentation cabinet structural supports in question may have been performed by welders qualified in the proper position; however, there were no inspection records available to verify that this was true.

The NRC staff reviewed the allegation that an unqualified QC inspector was examining welds on instrumentation cabinet supports. LP&L was committed to ANSI N45.2.6-1973, "Qualification of Inspection, Examination and Testing Personnel for the Construction Phase of Nuclear Power Plants." A review of the J. A. Jones QA manual, Attachment F, "Quality Assurance Personnel Training and Certification Program" (June 18, 1975), indicated that it was in compliance with ANSI N45.2.6-1973. A review of the QC inspector's qualification records indicated that he was qualified and certified to perform the inspections as a Level I. However, further examination of the QC inspector's records indicated that he was not properly certified as a Level II QC inspector. An interoffice memorandum dated August 17, 1979, by J. A. Jones QA Manager removed formal classroom training and proficiency testing due to his experience. J. A. Jones QA manual requires that a Level II inspector shall complete, as a minimum, 16 hours of formal classroom training and shall satisfactorily pass the Level II examinations.

The item of safety significance arising from these allegations is that the quality of welds made on safety-related supports is indeterminate. This appears to be an isolated case not previously identified by LP&L and, therefore, has no generic implications. Inspections required were completed by a Level I inspector as required for this specific work.

Actions Required: See Item No. 9 in the enclosure to the letter from D. Eisenhut to J. M Cain (LP&L), June 13, 1984.

Task: Allegations A-165, A-166, A-292, A-293, A-297, A-299, A-300

Characterization: The allegation is that the activities of EBASCO vendor quality assurance (QA) personnel, and the vendor QA records were not adequate.

Assessment of Allegation: The implied significance of this allegation is that the EBASCO QA personnel dealing with the vendors were not performing their job adequately and that problems with QA records generated by the vendor could exist which could affect the acceptability of safety-related material and equipment.

In assessing this allegation, the NRC staff reviewed the following types of information: (1) EBASCO's Nuclear Quality Assurance Program, particularly the sections dealing with surveillance, (2) the letter that the allegation was based on, (3) letters on file dealing with EBASCO's attempts to clear deficiencies with vendor documentation, (4) interviews/conversations with EBASCO personnel, (5) the EBASCO deficiency record file, (6) the EBASCO master list of deficiencies dealing with documentation, (7) the EBASCO master list of deficiencies dealing with radiograph files, (8) two audits reports, (9) receipt, receipt inspection, and conditional release system, and (10) selected vendor documentation quality records.

This review revealed that EBASCO was aware of the issues identified in the allegation and that it was based largely on an EBASCO assessment of problems with vendor/subcontractor QA records that had been uncovered by EBASCO during a QA records review prior to turning those records over to Louisiana Power and Light (LP&L). The NRC staff investigation also disclosed that EBASCO conducted a thorough review of the vendor records. EBASCO detected some problems with those records that were identified on NCRs and DRs. The NCR and DR dispositions included:

(1) EBASCO engineering specialists, who were cognizant of the work, closed out nonconformance reports (NCRs) and deficiency reports (DRs) which were based on incomplete applicant inspection reports.

(2) Reinspecting all the work done by American Bridge (AB), redoing faulty work by AB, reinspecting the rework, and generating complete inspection records for all the AB work.

(3) Obtaining material certifications for material supplied by Chicago Bridge and Iron (CB&I) that had been erroneously classified "D" material by CB&I. ("D" material was used in non-ASME/non-pressure boundary situations and did not require material certification).

The above allegation, which has been resolved was largely based on a situation that had existed prior to the allegation, and was being resolved at the time the allegation was made.

The NRC staff also reviewed a selection of Dravo and Southwest Engineering documentation packages and found them to be complete, technically adequate, and appropriately reviewed and approved by EBASCO. In addition, the staff reviewed selected documentation for the following EBASCO-procured stock material: pipe,

tubing, valves, welding filler materials, and bolting. This material was installed by EBASCO, Tompkins-Beckwith (T-B), and Mercury. The staff review found that this material meets the requirements. Various traceability issues were addressed in NCRs, and the results of the NRC review for those is denoted under Allegations A-33, A-55, A-56, A-61, A-67 through A-77, A-84, and A-329.

The staff has concluded that the specific allegation has little safety significance. However, during the NRC staff review, a list of deficiencies associated with conditional certification of equipment (C of E) was found for equipment supplied by CE. For example, one conditional C of E for the reactor vessel and internals was issued because as-built drawings, material certifications, and the fabrication plans (as-built drawings) had not been forwarded when the equipment was delivered to LP&L in 1976. The missing documents were reportedly sent to EBASCO sometime in 1978, according to the EBASCO quality records supervisor, but were apparently lost prior to being placed in the EBASCO document control system. The conditional C of E was found when a check of all files was made in April or May 14, 1984. The missing documents have been requested from CE, and a deficiency report was issued and placed on a master deficiency list. This problem has existed since July 20, 1976.

An important aspect of the reactor vessel documentation deficiency was that the deficiency was not identified by either the EBASCO or LP&L QA program and was not on a master tracking list; it was found only as a result of a check of the files.

The use of a formal document tracking system was not initiated until the problem was identified by the NRC staff. The absence of a formal tracking system may also mean that not all CE conditional releases have been identified. Additionally, the requirements for proper identification for nonconformances, corrective actions, and the use of conditional releases was not complied with by EBASCO or LP&L, indicating a partial breakdown of the QA program. It should also be noted that the plant is now constructed, inspected, tested, and ready to load fuel. This oversight was not identified to LP&L Startup and Testing as a turnover exception, nor were they aware it existed prior to NRC detection.

Deficiencies in EBASCO's identification of conditional C of E's, and in the tracking system have been corrected. Reportedly, vendor quality records have been reviewed for conditional C of E's. EBASCO has included them in their computer tracking system as a means to alert EBASCO management of problems, and strong efforts have been made to complete the record deficiencies. In particular, the conditional C of E and associated documents for the reactor vessel and hardware were provided to LP&L in May 1984.

The NRC staff during this review also discovered that the EBASCO system for conditional releases (CRs) was not adequately implemented in that the major overriding factor, "schedule," caused the system to be watered-down. Additionally, the EBASCO procedure ASP-IV-86, Conditional Release Control, did not address the time frame for the resolution and closure of conditional releases. The time frame for 15 conditional releases had been revised from "Prior to System Turnover" to "Prior to Fuel Load" to "Prior to Commercial Operation." Two of the 15 CRs were for pressure boundary parts, flanges, and end caps. These CRs were resolved and closed during this NRC inspection.

Other CRs affected Safety Injection and Component Cooling Water Valves, which are primarily equipment qualification problems. It should, however, be noted that all the CRs have been identified and tracked as system turnover exceptions.

Actions Required: See item 5 of the enclosure to the D. Eisenhut letter to J. M. Cain dated June 13, 1984.

Task: Allegation A-168

Characterization: It is alleged that poor quality control by American Bridge (AB) resulted in a lack of traceability of 2300 pounds of non-safety weld rod and that this material may have been used in safety-related structures.

Assessment of Allegation: The lack of traceability of the non-safety weld rod was identified in nonconformance report (NCR) W3-5791 issued by EBASCO Services Incorporated on February 23, 1983. The NCR was closed by EBASCO on March 14, 1984. The 2300 pounds of non-safety E-7028 rod consisted of 1550 pounds of 5/32-inch diameter rods and 750 pounds of 3/16-inch diameter rods. These rods were purchased from Woodward Wight and Company on January 13, 1978 under EBASCO Purchase Order No. WP3-1098. The original order was for 1800 pounds of 5/32-inch diameter rod and 800 pounds of 3/16-inch diameter rod. However, the material received was damaged and 250 pounds of 5/32-inch diameter rod and 50 pounds of 3/16-inch diameter rod were returned to the supplier, a fact reflected in Supplement 1 to Purchase Order WP3-1098, February 6, 1978.

There are no records that directly link the weld rod used to a specific weldment. Of the two sizes of weld rods, EBASCO was able to obtain a sufficient amount of the 3/16-inch diameter material to have qualification tests performed on the material. The results of the tests, performed by Lucius Pitkin, Inc., are contained in a report submitted to EBASCO on March 31, 1983 (L.P. No. M-7150) and indicate that the 3/16-inch diameter material (heat number 1130BB) met the ASME Code requirements for safety-grade weld rod. Thus, the concern regarding the 3/16-inch diameter rods was eliminated.

Regarding the 5/32-inch diameter weld rods, two heat/lot numbers were purchased (10RR19 and 10RS21), although the material could not be located for qualification tests. However, the American Bridge "Weld Rod Control Issuing Oven Records" document the heat number and amount, in pounds, of weld rod issued daily to different welders, and the "Welders Daily Observation Log" shows the location where each welder worked. Review of these records by AB and EBASCO indicated that the 5/32-inch diameter weld rods were used on non-safety related structures, specifically on the metal deck plates in the turbine building. The NRC also reviewed these records and found a discrepancy between the total weight issued (1735 lbs) and the total weight of rods purchased (1550 lbs). The explanation given by EBASCO is that this discrepancy is the result of inaccuracy in recording the "issued" weights since the issued material for non-safety work is not closely controlled.

In addition to the above, the basic problem with the qualification of the E7028 weld rods originates from the fact that Woodward and Wight Co. is not an approved supplier. However, the welding rods in question were supplied in sealed canisters to Woodward and Wight Company by Lincoln Arc Welding, which is an approved supplier. Furthermore, it should be noted that the unique characteristic of the E 7028 weld rods is that they can be used only on horizontal welds. Welders would have great difficulty attempting to use these rods for vertical or overhead welds.

Based on this review, the NRC staff concludes that the E7028 weld rods were not used in safety-related structures. Therefore, this allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-169

Characterization: It is alleged that an EBASCO engineer closed out a nonconformance report (NCR) without sufficient technical justification. This particular NCR concerns work done by American Bridge on steel beam connections, known as coping, which provides clearance between intersecting beams.

Assessment of Allegation: The NRC staff found that, subsequent to the allegation, the applicant reopened the issue and performed 100 percent inspection of the reactor auxiliary building steel beam connections. As a result, LP&L issued over 60 discrepancy notices and performed numerous physical corrective measures in the field. These corrective measures included retorquing of bolts and repairing of the coping radius, where it did not meet the required dimensions and quality.

As a result of this review, the NRC staff found that the copes now meet the requirements of Section 1.23.2 of the American Institute of Steel Construction Specification which requires a minimum radius of ½ inch.

As a result of LP&L's actions, the NRC staff concludes that this item has neither safety significance nor generic implication.

Actions Required: None.

Task: Allegation A-170

Characterization: It is alleged that an EBASCO discrepancy notice (DN) was not properly dispositioned for missing reinforcing steel in the fuel handling building (FHB) during an incident in which two EBASCO inspectors were told to leave the placement site, and that EBASCO may have lacked a procedure for upgrading engineering discrepancy notices (EDNs) to nonconformance reports (NCRs).

Assessment of Allegation: In assessing this allegation, the NRC staff found that an EBASCO QA inspector had noticed that reinforcing steel in the FHB was missing during a preplacement inspection and had issued a field change request prior to the placement of concrete to correct the deficiency. Prior to this corrective action, the EBASCO field engineer approved the preplacement package and, because of this signature, J. A. Jones and EBASCO supervision informed the EBASCO inspector and area engineer (who wanted to reinspect the missing reinforcing steel) that the placement had already been authorized and that no further inspection was necessary. As alleged, the inspectors were told to leave the site. However, the EBASCO QA engineer wrote a DN describing what happened, and it was this DN that finally resulted in the reinforcing steel being installed prior to concrete placement. This was the only instance identified of a confrontation between production and inspection personnel with any possible significance.

After examining the EBASCO procedure for handling EDNs, the NRC staff found that it does require that EDNs be upgraded to NCRs when an EDN is safety related. Furthermore, a staff review of 120 EDNs revealed that several were upgraded to NCRs. The staff therefore concluded that the use of the EDN had been adequate in the civil-structural discipline.

The implied significance of this allegation is that EBASCO DNs and EDNs were not receiving proper management evaluation and that EDNs were being used to avoid NCRs. The NRC staff found one instance of an initial oversight that was subsequently corrected when the EBASCO QA engineer wrote a DN to ensure installation of the missing reinforcing steel. The staff found in the civil-structural discipline no examples of EDNs that should have been upgraded to NCRs and were not. Also found were examples of EDNs that had been properly upgraded to NCRs, thus indicating that EBASCO procedures were functioning as intended. Accordingly, this allegation has neither safety significance nor generic implications.

Action Required: None.

Task: Allegation A-171

Characterization: It is alleged that, EBASCO's practice of allowing the use of oversize Cadweld sleeves to make Cadweld splices might have impaired the quality of Cadweld splicing, and that this practice was authorized by a "speed letter" which is not part of the quality system.

Assessment of Allegation: The NRC staff reviewed a file of speed letters, which were not part of a quality assurance records system, and extracted two letters which authorized the use of Cadweld sleeves one size larger than the reinforcing bar to be spliced. No documentation from the sleeve manufacturer, Erico Products, Inc. (Erico), could be located in the files for the Waterford 3 project, although several EBASCO personnel indicated that manufacturer's procedures had been followed when the larger splice sleeve was used. The NRC staff was aware of the fact that use of a larger sleeve has been an accepted industry practice as long as the powder charge was increased so as to completely fill the annular space between the bars and the sleeve with the Cadweld melt material.

At the request of the NRC staff, EBASCO obtained documents supporting the actions they had taken. These documents contained Erico's statment that the practice of using a sleeve of the next larger size than the reinforcing bars to be spliced was acceptable with an increase in the powder charge. Additionally the results of a series of tensile tests performed earlier by Erico to support the application of the larger sleeve were also obtained. Erico enclosed another set of documents which defined the necessary weights of the various charges required for increasing the powder charge. The NRC staff agreed that this practice and the associated information was acceptable.

The NRC staff was aware that the result of using a charge too small for a splice would be easily detected during a visual inspection by the QC inspector by observing incomplete filling in the end(s) of the sleeve.

Two other speed letters reviewed by the NRC staff addressed the use of a specific #6 Cadweld sleeve for use in a direct weld to a steel plate or shape with proper end preparation for a J-groove weld, and addressed the practice of adding powder to some cartridge kits. Both of these actions were acceptable to the NRC staff under the manufacturer's standard use of this commercial construction product.

The NRC staff had no major concern over the fact that speed letters were used in these instances. The practices noted in these speed letters were basically the recommendations by the manufacturer and represented standard construction practice. These practices had generally developed since the original specification for the project was prepared, so they were not specifically addressed by that specification, but the technical issues involved were acceptable to the NRC staff. This allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegations A-172, A-174

Characterization: The allegation is that Tompkins-Beckwith (T-B) heat number records may have been falsified.

Assessment of Allegation: The implied significance of this allegation is that heat numbers may have been falsified and that the quality assurance (QA) documentation may not reflect the actual hardware in the plant.

The NRC staff investigated the technical aspects of this allegation by reviewing LP&L, EBASCO, T-B, and Mercury Company document system procedures and comparing them with the ASME Code and the applicable ANSI N45.2 requirements. The procedures address authorized changes to QA documents and were found to be adequate. (Also see Allegations A-35, A-308.)

The NRC staff reviewed a sample of T-B, Mercury, EBASCO Construction (Force Account), and NISCO turnover documentation packages and found them adequate. The results are detailed in Allegation A-308.

The NRC staff selected a random sample of heat numbers from these documentation packages, where along with heat number data presented by T-B and EBASCO satisfied the NRC staff that the heat numbers were valid. The NRC staff found no indications that heat numbers had been falsified.

In conclusion, based on the NRC staff review, no indications of falsification was detected. This allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-177

Characterization: It is alleged that an EBASCO quality assurance (QA) inspector did not exercise proper judgment and may not be doing his job honestly while dispositioning nonconformance reports (NCRs) concerning American Bridge Company steel construction work.

Assessment of Allegation: The allegation has no safety significance since all American Bridge Company (AB) work had been reinspected after the allegation was made, resulting in discrepancy notices (DNs), two NCRs, and appropriate corrective measures for the work in question. The alleger also stated that he no longer had any concern over AB work. The NRC staff also reviewed the two NCRs addressing this subject and found no questions or concerns.

The NRC staff is satisfied, based on the review of the NCRs, that the safety issues related to AB have been properly addressed.

Actions Required: None.

Task: Allegation A-182

Characterization: It is alleged that welding performed by J. A. Jones Construction Company on structural items such as pipe hangers or supports for heating, ventilating and air conditioning systems has not been inspected.

Assessment of Allegation: In reviewing this allegation, the NRC staff found that the J. A. Jones QA project manager had submitted a letter to EBASCO Services on January 12, 1981, listing all incomplete inspections that needed to be completed by EBASCO force account, including welding, as of that date.

Based on a discussion between the NRC staff and the J. A. Jones QA Project Manager, the NRC staff found that all items which had not been inspected by J. A. Jones or EBASCO appear on the list. The letter listed all structural items, both non-safety and safety-related, that had incomplete inspections. The NRC staff reviewed all EBASCO safety-related process control sheets (PCS) and travelers, and found no discrepancies. This review substantiated that the work and related documentation is now complete.

The NRC staff concludes that this allegation has neither safety significance nor generic implications.

Actions Required: None.

Task. Allegation A-183(a), A-184

Characterization: It is alleged that Mercury documentation in OCR record packages contains generic deficiencies which indicate a partial breakdown of the QA program.

Assessment of Allegation: The implied significance of this allegation is that generic deficiencies in the Mercury QA OCR record packages could cause the quality of construction to be questionable.

The NRC staff reviewed ten Mercury operational control record (OCR) packages. The ten packages documented approximately 60 instrument lines with at least ten welds in each line. Although the weld records were very difficult to trace, they were found to be complete and acceptable. During the review the staff noted that numerous records (approximately 80 percent) were photocopies, with varying percentages of original entries. The remaining records (approximately 20 percent) were all originals. All record copies were properly completed, including initials for cross-outs.

The NRC staff also interviewed key personnel from Ebasco and LP&L that were cognizant of QA documentation turnover package preparation, review and filing. Mercury Company personnel were not available to be interviewed.

The allegation pertaining to a QA program breakdown is addressed in Allegation A-48.

The NRC staff concluded that this allegation has neither safety significance nor generic implications. It is also noted that there is no requirement in ANSI N45.2.9 for records to be originals.

Actions Required: None

Task: Allegation A-185

Characterization: The allegation is that a written procedure does not exist for joint Mercury/EBASCO review of system turnover documentation.

Assessment of Allegation: The lack of a written procedure may cause an inadequate review of quality-related documentation which could have affected verification of the quality of safety-related systems.

Based upon Significant Construction Deficiency (SCD) No. 57, EBASCO instituted a joint Mercury/EBASCO review of contractor turnover packages. SCD 57 was issued to identify problems with Startup System's (SUS) Nos. 59, 60A, B, and C. Because Mercury QA records contained inadequate installation and turnover documentation, a joint Mercury/EBASCO review of Mercury's turnover documentation was performed to eliminate excessive Mercury documentation deficiencies; prior to turnover to EBASCO. Mercury performed turnover documentation review at their facility in accordance with Mercury QC Procedure 3010 (N49720 Suppl) - Quality Assurance Records Control. The review compared the turnover package QA records against project specifications and identified deficiencies and corresponding corrective actions to close these deficiencies. At this point, an EBASCO reviewer would evaluate Mercury's package review for adequacy. EBASCO would either agree, disagree, or add additional deficient-action items. Each action Mercury completed was documented on a Mercury checklist.

EBASCO procedure QAI-9 (original Revision 0, dated October 29, 1979), Review and Handling of Construction Installation Records, was in place and was being originally used for the review process. A specific, detailed EBASCO procedure was not written for joint Mercury/EBASCO turnover package reviews. However, EBASCO procedure QAI 9A, Revision 0, dated September 21, 1982, Record Statusing to Support Startup System Turnover, was in effect during joint EBASCO/Mercury reviews. This procedure was generic in nature and provided instruction to delineate guidelines for in-process and status-checking of construction-installation QA records. The procedure included guidelines for: responsibilities; review of records completeness; accuracy of content; proper form; traceability; legibility; and authenticity. It also provided forms to document record review with the status (accept/reject) of individual documents within the package, and noted that deficiencies detected during review were to be documented on Form QAI 9.2. On October 8, 1982, EBASCO issued a supplement to QAI 9A (QAIRG No. 15) for EBASCO QAIRG reviewers to evaluate Mercury's turnover packages for Contract W3-NY-15. This procedure delineated the specific documentation, by form number, that Mercury's package should include.

Even though no specific EBASCO/Mercury joint review procedure was in existence, by adhering to EBASCO procedure QAI 9, QAI 9A, and Mercury QC Procedure QCP-3010, joint Mercury/EBASCO reviewers had adequate procedural guidance to perform and document review activities.

It should also be noted that the EBASCO joint review with other site contractors was performed using the same procedural mechanism as previously described for Mercury.

The NRC staff concludes that this allegation has no safety significance and is not indicative of any adverse generic or management implications.

Actions Required: None.

179

Task: Allegation A-186(a)

Characterization: It is alleged that EBASCO quality assurance (QA) surveillance did not monitor contractor work activity, e.g., documentation.

Assessment of Allegation: The implied significance is that without adequate QA surveillances, EBASCO and LP&L could not assure that the contractor's QA programs were being properly implemented. Therefore, the quality of the installation and inspection programs could be questionable.

The NRC staff reviewed 462 surveillance reports covering a 5-year period of construction activity. The reports were reviewed for type of inspection performed, type of documents reviewed, validity of corrective action, and follow up and response time for corrective action. The staff reviewed trend analy s reports to determine transmittal of surveillance report information, corrective action response, and closure. QA surveillance personnel qualifications were also reviewed.

The NRC staff found that corrective action was not always timely but was followed up, and that reports were closed out in all cases reviewed. In some cases, corrective action was not accepted by EBASCO QA, and surveillance reports were returned to the contractor for satisfactory resolution. Surveillance reports indicated that all contractors were monitored at various times during their work and documentation activities. The NRC staff determined that EBASCO personnel performing the surveillance activities were certified and qualified to perform their surveillance duties.

Based upon its review, the NRC staff concluded that the EBASCO surveillance program meets the intent of the EBASCO Quality Assurance program. Therefore, this allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-186(b)

Characterization: It is alleged that an EBASCO Records Reviewer stamped off 1,600 civil records (concrete) in an 8-hour work day in September 1982.

Assessment of Allegation: The implied significance of this allegation is that incomplete records, and improper review of quality records for technical adequacy, could cause the quality of construction and the results of inspections to be questionable.

The NRC staff interviewed the EBASCO records reviewer and the immediate supervisor, and compared the individual's qualifications to the job prerequisites. The staff examined EBASCO's review of contractors' civil records stored in EBASCO's vault, and also reviewed the basis for the excessive amount of documents stamped off in a short time frame.

The NRC staff found during the interview of the individual and his immediate supervisor that the individual's role in documentation review of civil concrete quality records was as follows:

1. His actual job description was Records Coordinator, not Records Reviewer as stated by the alleger. The Coordinator's responsibility was to assemble, into one task file, various quality records from contractors participating in concrete placement (i.e., concrete pour package). It appeared that the alleger was unaware of the difference in the job descriptions between a Records Reviewer and a Records Coordinator.

2. The types of records assembled by this individual into the files that were transmitted to EBASCO's vault for EBASCO QAIRG review included (a) top tier concrete drawings (DWGs); and (b) individual pour packages associated with those DWGs, including batch (concrete placement pour) slips, concrete material testing reports, gradation sheets from the batch plant for sand and gravel, etc.; and (c) quality related activity and inspection records for preplacement (rebar, inplacements, and forms), placement of concrete, curing of concrete, and postplacement (form removal and checking for voids).

Contractors involved with preplacement, placement, postplacement activities were J. A. Jones, American Bridge, Allied, Gulf Engineering, and Peabody Testing (GEO).

Document review and collation by the Records Coordinator was for sorting and accumulating concrete documentation by task or activity. This was not a review for technical adequacy. This review included completeness, proper form, legibility, and authenticity of documentation. Upon completion of records collation and review, the Records Coordinator grouped the records by type and task. Prior to submission to the EBASCO vault for QAIRG review, the Coordinator stamped the records to signify accountability and review action complete.

Transmittal packages to the vault could contain up to 250 records. In a day, between 500 to 600 records were stamped and submitted to the vault. The governing procedure for this activity was EBASCO generic procedure QAI-9.

The NRC staff compared the individual's qualifications to his job assignment. It was determined that his qualifications complied with the job performance prerequisites. It was also noted that he did not receive the QAIRG review training; however, since no review for technical adequacy, accuracy of content, or traceability was required, his past experience, training and education provided adequate qualifications.

The allegation identified that during an EBASCO QAIRG technical review of 70 of the 1,200 civil concrete pour package quality records numerous problems were identified. Based upon deficiencies noted during this review, several discrepancy reports (DRs) were initiated, and nonconformance reports (NCRs) were then issued identifying generic discrepancies. To disposition the NCRs, the QAIRG initiated a 100% re-review of the concrete packages. The NRC staff interviewed the alleger, who stated he was satisfied with EBASCO's corrective action.

For further information regarding the alleged individual's stamping ("bean counting") and document review, see Allegations A-143 and A-289.

In conclusion, the individual's stamping was not to document technical review, but to account for and collate records. This allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-187

Characterization: The allegation is that Mercury instrumentation drawings were not correct because field changes were not incorporated into the drawings, many drawings contained red lined changes, and two or three drawings for the same installation were marked differently.

Assessment of Allegation: The implied significance of this allegation is that inadequate control of field changes could result in as-built drawings that do not reflect the actual plant configuration. Multiple red lines on the same drawing may cause confusion that could lead to inadequate inspection of the affected systems.

In assessing this allegation, the NRC staff reviewed the Mercury Company's procedures for red lining drawings and for document control, examined Mercury drawings, and conducted a walkdown of a sample of completed systems, using the as-built drawings. Out of 19 randomly selected instrument lines which were field checked by the NRC, one process tubing deviation from the as-built drawings was identified. This deviation was for an LP&L-installed modification that had not been completed. LP&L had documentation on file reflecting the change and indicating the incomplete status of the field work.

As a result of this review, the NRC staff determined that the Mercury system for red lining drawings was cumbersome. It allowed controlled copies of a drawing and its revision to show different changes. This occurred if nonpressure boundary field changes were made after the pressure boundary portion of the drawing had been completed.

In conclusion, the as-built drawings reflected the actual condition of the installed hardware, and although accurate, this allegation had neither safety significance nor generic implications.

Actions Required: None.

Task: Allegations A-188, A-190, A-191, A-193

Characterization: The allegations is that Mercury Construction Company's procedures for review of quality assurance (QA) records or documentation packages were vague, loose, had not been properly reviewed by EBASCO and LP&L Engineers, and did not meet the requirements of ANSI Standards or the ASME Code requirements.

Assessment of Allegation: The implied significance of this allegation is that if the Mercury records review procedures were inadequate, the records review of safety-related systems may not have assured the acceptability of the systems installed by Mercury.

The NRC staff investigated the allegation by evaluating (1) Mercury's "Review and Handling of Construction-Installation Records" procedures for compliance with ANSI and ASME requirements; (2) EBASCO's program for reviewing and approving contractor procedures prior to issuance; and (3) task reports regarding the NRC staff review of Mercury's turnover documentation packages for procedural implementation.

Mercury Company Review

The NRC staff compared Mercury's QA record control procedures with the ASME Code, 10 CFR 50, Appendix B, and the applicable ANSI N45.2 requirements and found them acceptable. The procedures provided guidelines and established minimum requirements for the collection, control, review, filing, storage, maintenance, and disposition of quality assurance records. Their "System Turnover Document Package" included: test records; drawings; equipment lists; and other records supporting construction activities. The types of quality records which were to be included in the System Document Turnover Packages were:

1. Documentation requirements index, which identified required quality records and included package review completion and acceptance signatures dated by Mercury and the Authorized Nuclear Inspector (ANI).

2. Equipment Installation Form 277.

3. Expansion Anchor Installation Form 277A.

4. Piping Tubing Inspection Report Form 276-1.

5. Tube Tray Inspection Report Form 262-A-1.

6. Hanger and Support Inspection Form 262-1.

7. Weld Data Reports Forms 197-1, -2 or -3.

8. Material Verification Reports Form 198.1-1 (as applicable).

9. Failed Anchor Reports Form 211A.

10. QC Report (general) Form 211 (as applicable).

11. Process Control Traveler Form 208.

12. Operation Control Report Form 110.

13. Reference to Code Data Reports or Copies of Code Data Records.

14. QC Pressure Test Reports Form 216.

15. Pressure Testing Requirements.

16. NDE Reports.

17. Mercury Drawings.

EBASCO Review

EBASCO's program for procedural review and approval included procedures generated by EBASCO Engineering and all site construction contractors. The Site Quality Assurance Engineering Department and/or other EBASCO disciplines, as required, reviewed procedures affecting quality prior to implementation. Two procedures governed procedural review and approval. Procedure ASP-III, Preparation of Site Procedures, delineated guidelines for preparation, scope of procedures, instructions for procedural content, procedure, approval, issuance, and the revision mechanism. Procedure QAI-2, QA Review of Site Generated Procedures of Activities Affecting Quality, details the methods for procedural review and documenting comments applicable to the review; the resolution and acceptance of procedural comments; and final acceptance of the procedure.

The NRC staff obtained a copy of EBASCO's review/comments and approval for the initial and current revision of Mercury's QA Records Control Procedure QCP-3010. The objective was to verify that EBASCO had reviewed and approved Mercury's procedures prior to implementation. These documents contained recorded comments with accepted resolution, and approval granted to Mercury for issuance and implementation.

The staff also reviewed a number of Mercury turnover QA documentation packages for the Reactor Coolant instrument lines. These packages had been reviewed and approved by Mercury's QA personnel, using QCP-3010, documentation review procedure. EBASCO QAIRG also reviewed and approved these packages. Contained in the packages were the following types of quality documents:

A. EBASCO Review Check List (dated and signed by EBASCO QAIRG reviewer)

B. Mercury Documentation Requirements Form/RPT-Form 209 (Documentation Index)

C. Operations Control Report (OCR) cover sheet

D. Process Control Traveler

E. Pipe and Tube Inspection Report

F. Material Verification-Heat Numbers Traceable, CMTRs and C of C.

G. Weld Data Sheets

H. NDE Reports

I. Quality Control Reports-acceptance of work

J. NCRs

K. CIWAs

L. As-Built/Red-Lined Drawings (latest revisions)

M. Hydrostatic/Pneumatic Test (as applicable)

1. Hydrostatic/Pneumatic Test Instructions

2. Hydrostatic/Pneumatic Data Sheet

3. Valve Line-Up Sheet

4. Hydrostatic/Pneumatic Test Discrepancy List

5. Weld Data Sheet - information copy to verify weld number (not used for B31.1 test)

6. Calibration Sheets

7. Piping and Instrumentation Drawing

For further information regarding the staff's review of Mercury's documentation system, see Allegations A-308, A-183, A-184, A-197.

In conclusion, Mercury's QA records control procedures for the review of QA turnover documentation packages were found to be acceptable. Their procedures were compared with the appropriate ANSI and ASME requirements and found to be acceptable. EBASCO reviewed and approved Mercury's procedures prior to implementation. The NRC staff concludes that these allegations have neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-196

Characterization: The allegation is that the EBASCO Document Control Supervisor was unqualified for the position.

Assessment of Allegation: The implied significance of this allegation is that a document control supervisor without proper quality assurance (QA) training and background could adversely affect document review and records management.

The NRC staff reviewed training requirements and records, and held discussions with the EBASCO training coordinator and the Document Control Supervisor in examining this allegation.

The NRC staff found that EBASCO record reviewers were required to have, as a minimum, a high school education, and QA indoctrination, including lectures, reading assignments, and on-the-job training (OJT). The Document Control Supervisor held a BS degree in Economics, and had been employed by EBASCO in records management since 1976 as QA Records Coordinator (1976-1977), QA Records Representative (1977-1978), and QA Records Supervisor (1978-1984). The Document Control Supervisor had been an administrative manager over another supervisor, lead reviewer and record reviewers, and has supervised up to 150 EBASCO personnel after completing all the EBASCO requirements for records review supervisors.

There are no specific training, qualification or certification requirements for records reviewers in NRC regulations, the ASME Code, or ANSI standards. The EBASCO training program for records reviewers appeared to be adequate. The NRC staff concluded that the QA Records Supervisor and Documentation Manager is qualified. This allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegations A-197 through A-206, A-213, and A-216

Characterization: It is alleged that Mercury's corrective actions for problems relating to quality control (QC) weld record data sheets were not documented adequately, nor were the reasons for the corrective actions denoted.

Assessment of Allegation: The implied significance is that the lack of adequate review of documentation for technical adequacy and completeness could cause the quality of installation to be in question. Without proper corrective action to determine the root cause and to prevent recurrence, the problem may be corrected, but the system could continue to be deficient.

The NRC staff reviewed 10 operational control record (OCR) packages [refer to Allegations A-183(a) and A-184] and did not substantiate this allegation. However, the records reviewed by the NRC staff were at a later date and consequently, the record deficiencies identified by the alleger could not be verified.

The NRC staff discovered the following problem pertaining to missing QC records. Communications between LP&L and EBASCO had prompted an EBASCO revision to an LP&L drawing to clarify the "class break" for N1 instrument lines. The revision imposed ASME Class requirements for all installations between the process piping and the instruments for instrument lines installed after April 7, 1982. Prior to the revision, a class break was defined to show the location where ASME Class requirements did not apply and where ANSI B31.1 guidelines applied.

Although ANSI B31.1 guidelines do not address records retention, 10 CFR 50 Appendix B does require installation and inspection records. Therefore, for locally mounted N1 instruments, even though they were installed prior to April 7, 1982, the QC records could not be located.

The NRC staff found several deficiencies in N1 instrument records of installation and inspection in the zones classified under ANSI B31.1, including weld reports, welder identification, weld filler material, base material, and weld inspection results.

The NRC staff concludes that the lack of QC records for instrumentation installation to ANSI B31.1 is in violation of the requirements of 10 CFR 50 Appendix B, and related QA/QC program elements.

Actions Required: See Item 2 of the Enclosure to the letter from D. Eisenhut to J. M. Cain (LP&L) dated June 13, 1984.

Task: Allegation A-207

Characterization: The allegation is that on many occasions, Mercury quality assurance (QA) personnel were observed throwing away original documents after copies were made.

Assessment of Allegation: The implied significance of this allegation is that improper maintenance of QA records associated with the construction of safety-related systems can affect the quality of those systems.

The NRC staff reviewed this allegation against the standard QA good work practices outlined in ANSI N45.2.9, Section 3.2.1, which reads "QA records submitted for retention shall be legible, completely filled out and adequately identifiable to the item involved" and "These records may be either the original or a reproduced copy."

The Mercury procedure allowed the original records to be destroyed after a revision or change was accomplished. The final records did reflect the as-built system and were found to be adequate. The staff found no evidence of any "completed" records missing. There is no requirement to maintain inprocess records because of the definition in ANSI N45.2.9:

> "Quality Assurance Records - Those records which furnish documentary evidence of the quality of items and of activities affecting quality. For the purposes of this standard a document is considered a quality assurance record when the document has been completed."

The NRC staff reviewed Mercury QA records and found them legible, complete, and retrievable although many records were reproduced copies.

The NRC staff concludes, although the maintenance of reproduced copies in lieu of original records is somewhat unusual, that this allegation has no safety significance nor generic implications (pertained to Mercury Company only).

Actions Required: None.

Task: Allegation A-209

Characterization: It was alleged that review of Mercury weld records identified some welds that had not been fit-up or final inspected.

Assessment of Allegation: The implied safety significance of this allegation is that missed inspections could cause the quality of installation to be in question.

The NRC staff reviewed 10 operational control record (OCR) quality control (QC) packages for 60 instrumentation lines averaging 10 welds per line for a total of 600 welds. The weld records reviewed were found complete. However, the records review by the NRC staff took place at a later date and consequently the record deficiencies identified on earlier records by the alleger could not be verified.

The NRC staff review did reveal that an EBASCO nonconformance report (NCR) had been written and dispositioned for a weld FW-5 in OCR-1830 for the condition of no fit-up inspection (see Allegation A-232). The staff review provided no indications to show lack of fit-up or final inspections of welds. Where inspections had been missed, they were identified in the NCR and corrective action had been taken by Mercury.

The NRC staff concludes that this allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-211

Characterization: It is alleged that the Mercury Construction Company program for maintaining identification of instrumentation tubing hangers and supports during rework was not effective.

Assessment of Allegation: The NRC staff reviewed Mercury's documentation and conducted sample inspections of actual hanger and support installations.

The NRC staff verified the existence of Mercury procedures which were used to ensure the proper documentation of any removed, relocated, or replaced hangers and supports. Mercury used the procedures and a process control and work-authorizing traveler system to guide documentation of its mechanical instrumentation tubing installation activities for meeting system design requirements.

The NRC staff believes that the allegation was based upon information about temporary hangers and supports provided for test purposes, or upon conditions that were identified by the early 1982 LP&L walkdowns and reviews of documentation packages. The system documentation packages had been turned over to LP&L quality assurance (QA) personnel after the Construction Manager had reviewed and accepted Mercury's records. In May 1982, LP&L QA identified inadequate installation documentation for startup system instrumentation and control after a combined walkdown and review of the documentation.

Numerous nonconformance reports (NCRs) were issued to identify and track the individual nonconformances discovered after LP&L refused to accept the documentation for startup system installation. LP&L issued Potentially Reportable Deficiency (PRD) 80 about these conditions on May 26, 1982, and notified the NRC on the same date.

LP&L completed the evaluation of PRD 80 and upgraded it to Significant Construction Deficiency (SCD) 57 on July 2, 1982. NRC was notified of SCD 57 on July 2, 1982. LP&L has submitted interim reports to NRC, apprising them of progress, with an expected closeout in June 1984.

In addition, NRC issued an inspection report to LP&L on December 6, 1982, identifying deficiencies involving QA records and construction practices. LP&L took prompt and extensive actions to identify and correct the problems.

Coincident with the NRC inspection report, the NRC issued a Notice of Violation and Proposed Civil Penalty to LP&L on December 6, 1982. The Notice evaluated the deficiencies as a Severity Level III violation. An Order Imposing A Civil Monetary Penalty was issued to LP&L on March 16, 1983; LP&L paid the civil penalty in April 1983.

The major problems with the Mercury identification system were found during LP&L's system reviews in early 1982. As a result of the LP&L findings, work performed by Mercury underwent a 100% reinspection, rework and record re-review. LP&L took prompt and extensive actions necessary to identify and correct resulting problems.

In assessing this allegation, the NRC staff witnessed rework being done on two randomly selected supports. In addition, the staff reviewed eight related documentation packages. No discrepancies were found. Although the final LP&L report to close out the issue is near completion, it has not yet been submitted. The NRC's final closeout of this allegation depends on confirmatory review of the final report.

The NRC staff discussed its findings with the alleger and he expressed satisfaction with the NRC effort.

This issue has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-214

Characterization: The allegation is that quality control (QC) weld data reports from Mercury Construction Company during 1981 contained incorrect filler material certification because QC personnel would obtain a heat number for filler material and continue to record that number whether or not it was correct.

Assessment of Allegation: The implied significance of this allegation is that traceability of materials may have been lost, thus causing the validity of the installed material containing the required certification to be questionable.

In assessing the technical aspects of this allegation the NRC staff reviewed Mercury weld data reports and took random samples of filler material heat numbers for verification of their traceability to Certified Material Test Reports (CMTRs). Procurement Purchase Orders and CMTRs were also reviewed for heat numbers sampled and were found to be acceptable.

In addition, the staff reviewed six operational control record (OCR) packages which contained weld records for 28 different instrument lines. No indications of adding or falsifying heat numbers was found. However, many of the first issue (pink sheets) Mercury weld records were a combination of photocopy and original (pen and ink) data. Thus the original documents in most cases were not available for review. It is noted that there is no requirement for the maintenance of original records in lieu of photocopies. (See Allegation A-207 for NRC staff finding pertaining to the descruction of historical records.)

In conclusion, this allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-215, A-175, A-239, A-240, A-306i

Characterization: It is alleged that a deficiency report (DR) on welder qualifications was destroyed, and that the quality of welding was questionable because welders were not qualified, were not on the project at the time welding was performed, and were not qualified to correct procedures and techniques.

Assessment of Allegation: The implied significance of this allegation is that unqualified welders may have performed welding on safety-related systems, which could place the quality of construction in question.

The NRC staff reviewed the welder qualifications for randomly selected EBASCO, Tompkins-Beckwith (T-B), NISCO, and Mercury welders who may have performed welding on safety-related systems.

The NRC staff selected a random sample of 25 EBASCO welders from travelers, weld rod control forms, and the welder qualifications summary. EBASCO welder qualifications records were reviewed for compliance with the ASME and AWS Codes and EBASCO procedures. The NRC staff found the EBASCO welders qualified or partially qualified to the referenced weld procedures. In each case the welder qualification status record identified the limitations of qualification for each welder, when partial qualification (thickness range) was required. The NRC staff found EBASCO welder qualifications records and status records to be acceptable.

The NRC staff selected a random sample of 57 T-B welder qualifications records. In some cases the staff noted that the T-B welder qualifications records for a specific welding procedure specification (WPS) were not included in a welder's file. However, the staff reviewed other WPSs, the welder qualification cross-reference list, and the welders qualification summary, and verified that the T-B welders were properly qualified in accordance with the ASME and AWS Codes and T-B procedures. The NRC staff found T-B welder qualifications records to be acceptable.

The NRC staff selected a random sample of 11 NISCO welder qualifications records from completed quality records. The staff found that the qualifications for the selected NISCO welders were in accordance with the requirements of the ASME Code and NISCO procedures. The NRC staff found NISCO welder qualifications records to be acceptable.

The NRC staff selected a random sample of 62 Mercury welder qualifications records. Of the 62 sampled, the staff initially found problems with 12 welders. Following the NRC staff's identification of these problems, EBASCO issued Nonconformance Report (NCR) W3-7724. However, EBASCO's disposition of this NCR failed to adequately address these problems with Mercury welders and was not acceptable to the NRC staff.

The following problems were identified by the NRC staff, and in some cases were inadequately addressed in the EBASCO NCR. These problems included possible falsification of records (changes to qualification dates and to specific WPSs) and have been forwarded to the NRC Office of Investigations (OI) for their review.

1. Welder M-44 - It is alleged that an EBASCO DR was destroyed. The alleger supplied to the NRC staff a copy of an unnumbered EBASCO DR and a copy of the welder qualifications record; neither the DR nor the record could be located in EBASCO's file. The allegation specifically addressed this welder's qualifications record, which noted that the welder was originally qualified to WPS-B but that the record had been retyped "for clarity" and incorrectly indicated the welder was qualified to WPS-Y. The NRC staff reviewed the welder's qualifications record, but could find no qualification to WPS-Y, and found no documentation concerning the DR. LP&L must determine if this welder performed welds to WPS-Y.

2. Welder M-109 - The NRC staff found that the welder's WPS-Y qualifications record was dated November 26, 1982, and voided October 22, 1983; however, the welder qualification status record did not show qualification or welding performed to WPS-Y. Also, the EBASCO NCR disposition did not determine if the welder had performed welding to WPS-Y "at any time." Mercury welder qualification status records were not kept current as required, and could not be relied upon as a quality control (QC) record. A re-review of all weld data reports must be performed by LP&L to determine if this welder performed welds to WPS-Y.

3. Welder M-9 - This welder's qualification status record reflected dates different than those recorded on the welder qualifications record for WPS-E. This record had been revised to change the qualification test date from December 18, 1979, to December 18, 1978. However, the welder qualification status record indicated the test was performed on December 18, 1979, as originally dated. The actual date of the welder qualification test must be ascertained by LP&L to determine if the welder performed welding on safety-related systems prior to this date.

4. Welder M-101 - The NRC staff found that this welder was originally qualified to WPS-B but that the welder's qualification test record had been revised "for clarity" and the qualification changed to WPS-Y. EBASCO issued NCR W3-7724 to address this change but the disposition of this NCR was unacceptable to the NRC staff. LP&L must review 100% of weld data reports to determine if this welder performed welds to WPS-Y.

5. Welder M-129 - This welder's qualification test record indicated qualification to WPS-D but was not signed by a Mercury representative. The NRC staff reviewed the welder's qualifications record and determined that this welder was qualified to WPS-G, which also qualified the welder to WPS-D. The NRC staff found this acceptable.

6. Welder M-142 - The NRC staff found that this welder's qualification status record showed welds performed to WPS-D and WPS-Y; however, the welder's file contained no welder qualifications records. The welder qualifications records were later located, reviewed by the NRC staff, and found acceptable.

7. Welder M-85 - This welder had performed a qualification test to WPS-D, but the test report had been subsequently "voided" for an unspecified reason. A Welders Testing Laboratory test report for qualification to WPS-D was in the welder's file, but the NRC staff found no Mercury welder qualifications record. In addition, the welder's qualification status record indicated

that welds were performed during periods when the status record did not include the welder's name; the NRC staff learned that the welder had a break in employment with Mercury. The welder had performed welds for Mercury while employed by Fischbach & Moore; he had been "loaned" to Mercury, and his WPS-D qualifications were current. The NRC staff discovered that the welder's qualifications record had been "voided" because of improper changes to the form. EBASCO issued NCR W3-7724 to address these changes but the disposition of this NCR was unacceptable to the NRC staff.

8. Welder M-190 - The welder's file showed a termination date in late November 1982; however, the welder's qualification status record indicated the welder had performed welds through mid-January 1983. The welder's qualifications record did not indicate why this welder had performed welds since his termination. Subsequent to the initial review, LP&L supplied the NRC staff with employment records for this welder, which indicated that he had been rehired in late December 1982. The NRC staff reviewed these records and determined that this welder was employed at the site and was qualified during the time he performed welds.

9. Welder M-177 - This welder's name was typed over that of another welder qualified to WPS-G. There was no WPS-Y qualifications record, but the welder qualification status record indicated that he had performed welds to WPS-Y. The WPS-Y qualifications record was eventually located and filed with the welder's records, resolving the NRC staff's question concerning the welder's qualification. However, the document with the name typed over has been submitted to OI for their review of possible falsification of records.

10. Welder M-197 - This welder's file contained a record of test results which indicated failure to meet WPS-D qualification. However, the welder's qualification status record indicated that WPS-D qualification was met, yet the NRC staff found no qualifications record to this effect in the welder's file. WPS-D qualifications records were eventually located and inserted into the welder's file. The NRC staff subsequently verified the welder's WPS-D qualification, and the welder qualification status record was found to be acceptable.

11. Welder M-315 - This welder performed welding to WPS-D, but the NRC staff found no record of WPS-D qualification in the welder's file; however, the staff was able to verify that the welder was not qualified to WPS-D. The staff reviewed Weld Data Report OCR 1020 and discovered that the welder had started one weld to WPS-D which was rejected at fit-up for his being an "unqualified welder" and for his welds being "undercut and cracked," and that the defective weld had been removed and rewelded by a qualified welder. LP&L must review 100% of weld data reports to assure that this welder did not perform any welds for which he was not qualified.

12. Welder M-55 - The NRC staff reviewed examples supplied by the alleger of welder qualifications records alleged to contain improper utilization of combined welding processes [gas tungsten arc weld (GTAW) and submerged metal arc weld (SMAW)] to qualify welders beyond the thickness actually welded. In this welder's case, the staff found that the welder qualifications records clearly indicated that the correct process was utilized to

qualify this welder to WPS-Y. The staff also reviewed Procedure Qualification Record No. Y1679, and verified that procedure WPS-Y was in accordance with the ASME Code. The Code does not require that thickness range for each welding process be specified on the welder qualifications record, because these ranges are specified in the weld procedure specification to which the welder is qualified.

In the review of the 62 Mercury welder qualifications records, the NRC staff identified the 12 problems cited above and found the disposition of EBASCO NCR W3-7724 inadequate. In addition, the NRC staff found that welding filler material was not being controlled as required by the ASME or AWS Codes for low hydrogen welding electrodes (e.g., E-7018) for the rebaking process. The staff observed that low hydrogen welding electrodes were being rebaked at temperatures of 180°F to 220°F for a period of 8 hours. The staff learned that this was common site practice. The ASME and AWS Codes require that low hydrogen welding electrodes which exceed the 4-hour issue time constraint, or in the case of loss of power which exceed the 4-hour time period, be rebaked between 450°F to 800°F for 4 hours. EBASCO and site contractor procedures allowed the lower temperatures at the longer holding time, but proper justification could not be furnished to the NRC staff during the review. The welding electrode holding ovens on site did not have the rebake capability. Low hydrogen electrode coating is susceptible to absorbing moisture, which is a major contributing cause of underbead cracking.

Additionally, the NRC staff observed low hydrogen electrode E-7018 being issued from the rebake ovens. Controls did not provide for issuance until the rebaking process was complete.

Based on the review of this allegation, the NRC staff concluded that EBASCO, T-B, and NISCO welder qualifications were in compliance with ASME and AWS Code requirements. However, the staff found that Mercury welder qualifications records were not in accordance with ASME or AWS Code requirements due to improper maintenance of records, inadequate documentation of supervision of the Welders Testing Laboratory where the welders performed some of the qualification tests, and the discrepancies in welder qualifications cited previously. In addition, the staff found that the low hydrogen electrode rebake process on site was not in accordance with the ASME and AWS Codes.

This allegation has safety significance and generic implications.

Action Required: See Item No. 22 in the enclosure to the D. Eisenhut letter dated 6/13/84 to J. M. Cain (LP&L).

Task: Allegation A-220; A-233; A-235; A-236; A-251

Characterization: The allegation is that non-safety material (steel tubing adapters) was used in safety-related systems and that Mercury Nonconformance Reports (NCRs) on this subject were improperly dispositioned, closed, and never received an EBASCO NCR number.

Assessment of Allegation: A review of purchase orders related to the adapters revealed that approximately 850 of about 2000 such adapters lacked heat code markings. Those without a heat code were all purchased from 1978 to 1980. Those purchased after 1980 had heat code markings.

A check of the warehouse stock of adapters revealed that some adapters lacking heat codes were marked "Hold for QC" and painted yellow. The others showed heat code markings. To compare the number of adapters purchased with the possible quantity necessary for safety system instrumentation, an estimate of the number of applications for these specific adapters was made. First, the instrument installation details were checked to find installations which required these specific adapters (Bill of Material Number 325); then the instrument list was reviewed to find the number of instruments in P2 and P3 safety system applications. This review included all flow, level, differential pressure, and pressure instrumentation. A cross-check of the two resulting lists showed that there were approximately 400 such adapters needed in safety systems, in addition to some needed for replacement purposes. A review of adapters with a heat code, showed that approximately 480 were issued to Mercury. From this review it was concluded that, overall, the number of heat-coded adapters needed and the number of heat-coded adapters available appear to be in reasonable agreement.

An LP&L QA employee was interviewed regarding the original NCR on the problem. Mercury did a document review of safety-related operating control report (OCR) packages to verify heat numbers. In cases where the heat number could not be verified, the adapter was cut out. This was the case for the 32 adapters replaced in the original NCR package completed on May 25, 1982.

Subsequently, in the Fall of 1982, as part of a material reverification program, a 100 percent walkdown was done by Mercury from the instrument root valves to the instruments in P2 and P3 applications. (P2 and P3 include safety-related applications.) This reverification included the adapters in question. If the inspector could not physically see the heat code on the adapters, he would research the weld/material data sheets to verify that the number was included there. (Note: At the time of the walkdown, a larger number of installations had been made than when the original NCR was raised.) If the number could not be found in the field or in the document, an NCR would be initiated. In some cases, this involved scraping off paint and then reinspecting and in other cases it involved cutting out the adapters. From this walkdown, the applicant believed that all safety-related systems contained the required heat coded adapters.

A number of operating control report (OCR) packages for safety systems which included adapters were reviewed to verify that the heat code numbers were recorded when installed or during reweld. All the documentation contained a heat code.

About 20 field installations for safety systems with adapters were inspected to see if the heat numbers were visible. Most were fully visible, some were partially visible, and four were not visible. It was not always possible to see all the way around the adapter because of adjacent equipment. For those cases where they were not visible it was possible that the marks were there but that the weld or heavy paint obscured them.

As a follow up to the walkdown, the documentation was checked to see whether the heat numbers were verified in the OCR packages for those four cases where there was no physical indications of a heat number. For all cases the documentation showed the heat numbers.

Although the allegation only involved one-half to one-inch adapters, when looking at the OCR packages it was noted that for smaller adapters only "CAJON 316" was recorded. Also, during the walkdown some of the pressurizer pressure taps which have the smaller adapters were inspected. It was noted that no heat number was marked on the adapters. "CAJON 316" was the only factory marking that was visible. Therefore, this to was followed up with a review of the specific documentation. The CCR package for these adapters showed only "CAJON 316" in the record. A review of the applicable specification LOU 1564.407a, Section 15.02a showed that heat numbers were not required per the specification for these adapters.

The ASME (1974 version, 1976 addendum) Code requirements were checked to see if the code allowed such an exception. Based on the review, it was concluded that the ASME Code does allow this exception. In fact, the specification used the code wording. Therefore, this issue was not pursued further.

In one of the document packages reviewed (OCR - 1796), a closed NCR was found which appeared to be used to document the heat numbers, after paint removal, for 1" to 1/2" adapters when, in fact, the closure documented the heat numbers for 1-1/2" to 1" reducers on the same instrument installation. A look at the installation did not reveal the heat numbers. Therefore, it was questioned how an inspector could verify C-66 on November 24, 1982, while the record did not show a reweld on the 1" side. The record did show, however, that subsequent rework was done on the tube side of the adapter. It is possible that this rework removed the heat code if, for example, it had been etched on the adapter face.

Some subsequent NCRs related to the adapters were reviewed. In two NCRs, the adapters were not verified as containing heat codes. These adapters were cut out and replaced. Another NCR required the return of 120 non-coded adapters to the warehouse for nonsafety applications.

Therefore, it appears that subsequent NCRs were filed. This, however, does not necessarily indicate that additional non-safety adapters were installed in safety systems. It may only indicate that to be conservative, safety-related adapters were cut out if the code was not visible and the heat code was not included in the documentation.

Based on the field walkdown, document review, and discussion with the applicant it is concluded that: (1) there is reasonable assurance that the correct adapters with heat code are used in the safety systems; (2) both the coded and

noncoded adapters are specified to be the same material (i.e., 316 stainless steel); and (3) in at least one case a Mercury NCR was improperly dispositioned, closed, and never received an EBASCO NCR number.

With respect to the safety significance of the allegation, there is little if any safety significance even though one NCR was improperly closed. An NRC review indicates that there is reasonable assurance that the proper heat coded adapters are in the safety systems. The improper closure of NCR 1579 appears to be an isolated case and not generic with respect to the adapters.

Actions Required: LP&L must correctly close NCR-1579. See Item 6 in the enclosure to the D. Eisenhut letter of June 13, 1984, to J. M. Cain (LP&L).

Task: Allegation A-222, A-231

Characterization: The allegation is that the Mercury Construction Company's concrete expansion anchor installation and inspection procedure does not give sufficient guidance to inspection personnel to assure that all important physical characteristics are inspected for conformance to installation requirements.

Assessment of Allegation: The alleger provided a copy of a memorandum stating that Mercury Construction Procedure SP-666, Rev. 8, "Drilled-In Expansion Type Anchors in Concrete for Category I Structures," does not require QC verification of many characteristics necessary to ensure proper installation of concrete expansion anchors. These characteristics include:

- Spacing between adjacent anchors
- Spacing between an anchor and the edge of a concrete surface
- Spacing between an anchor and an embedded plate
- Minimum anchor embedment depth
- Grouting of unused/abandoned holes in the concrete
- Mounting plate size
- Size of holes in mounting plates and hole distance from plate edges

A review of procedure SP-666 revealed that, although most of the above - referenced requirements are addressed in Section 6.1 "Installation," they are not included within Section 6.2 "Inspection," as items requiring QC to verify. In addition, QC Inspection Report Form 277A, Rev. May 1982, "Equipment Installation (Anchors)," does not list these attributes as inspection points.

In an attempt to determine if QC inspectors were, in fact, inspecting concrete anchors for these attributes (over and above procedural instructions), 27 Mercury nonconformance reports, written between May 1979 and May 1983 were reviewed and found to address such installation deficiencies. However, of these 27, only 4 appear to have been initiated as a direct result of original inspections performed in accordance with Procedure SP-666. The remaining 23 were as a result of various walkdowns, surveillances, or of an undetermined nature.

A sample of installed concrete anchors in Diesel Generator Room "B," Component Cooling Heat Exchanger Rooms "A" and "B," and a hallway adjoining these rooms, was then inspected to determine whether installation deficiencies may have eluded detection due to the above procedural omissions. The inspection revealed six instances of spacing violations which had not been identified by Mercury QC. Although none of these six violations are considered significant, their discovery raises questions about the thoroughness of the overall inspection effort with respect to concrete anchors.

In summary, Procedure SP-666 does not provide sufficient direction to QC personnel to perform meaningful inspections; sufficient documentation does not exist to indicate that QC personnel were aware of all necessary installation criteria; and, the identified, currently existing discrepancies indicate that the inspection program utilized was not adequate to ensure that concrete anchors installed by Mercury Construction Company are in conformance with design requirements.

This allegation could have some safety significance and therefore some reinspection will be necessary. This is an example of a weakness in the QA inspection procedures which may be generic.

Actions Required: See Item No. 17 in the Enclosure to the D. Eisenhut letter to J. M. Cain, (LP&L), dated June 13, 1984.

Task: Allegation A-223

Characterization: The allegation is that there were documentation discrepancies between the field construction and QC packages, that Operational Control Records (OCRs) 492 and 903 had Penetrant Test (PT) reports and signatures missing and that repair data and documentation was confusing.

Assessment of Allegation: The implied significance of this allegation is that incomplete, missing, and conflicting documentation raise a question regarding the quality of the installation and the inspection results.

The NRC staff investigated this allegation by reviewing nine OCR packages, including OCRs 492 and 903. This was done to determine if the problems identified were generic. Systems reviewed included Reactor Coolant, Safety Injection, Feedwater, Charging Water, and Main Steam.

The review of OCRs 492 and 903 revealed no missing PT reports nor missing signatures. EBASCO originally reviewed all Mercury packages in accordance with QAI-9. Deficiency Reports (DR) were issued and tracked for all discrepancies noted during the EBASCO review. Deficiencies were corrected prior to system turnover.

During the NRC staff review of OCRs 1782 and 1924, one weld from each package was found to have missing PT records. Since the records could not be located in a timely manner, LP&L decided to perform additional penetrant testing to determine weld acceptability. LP&L and EBASCO had PTs performed on these two welds and both welds were acceptable.

The staff also found that field construction records (green sheets) were destroyed and that the only remaining record of work performed was the QA copy (pink sheets). These QA records were generally in poor physical condition and because of the many crossouts and explanatory notes, were confusing and difficult to follow. However, after an extensive review, the NRC staff was able to determine through actual inspection and review that the records, although in a less than desirable condition, were acceptable and adequately documented the actual as-built configuration. Later revisions of weld record QA sheets showed significant improvement in the quality of the records and had original data recorded on the original record form.

The NRC staff reviewed the QA documentation for approximately 600 welds and concluded the following: the missing PT records were isolated cases; the records were poorly maintained; weld history was difficult to follow; the filing system was extremely cumbersome, making retrievability difficult; and records were not always original copies (but originals are not a requirement). Even though the noted problems are a NRC concern, all requested records were available and were found to be acceptable. This allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegations A-224, A-228

Characterization: This allegation concerns a number of concerns regarding the "Hydrostatic or Pneumatic Testing Procedure" (MCP-2170), which was used by Mercury to test plant instrumentation systems.

Assessment of Allegation: The implied significance of this allegation is that 17 changes suggested by the procedure reviewer should have been made to the hydrotest procedure to properly reflect the requirements for implementing the test of instrumentation systems.

The NRC staff reviewed the alleger's comments and the procedure and concluded that many of the comments were editorial-type comments which could possibly improve the procedure. However, since the tests have been satisfactorily performed, the editorial comments were determined to have had no significant impact on the tests. The staff also noted that some of the comments were incorporated in a later revision of the procedure prior to performance of the tests. The staff found that there were a group of comments regarding the use of high point vents to vent air from the instrument lines. The fact that high point vents were not installed was addressed in allegation A-242. The NRC staff concluded that other measures employed during the hydrotests were adequate and, therefore, the tests were not invalidated.

The NRC staff concluded that the tests to which the procedure applied have already been completed and the evaluation of Allegation A-242 has concluded that the line venting was not invalidated by the lack of high point vents.

The staff concluded that this allegation has neither safety significance nor generic implications.

Action Required: None.

Task: Allegation A-225

Characterization: The allegation is that a concern regarding the supports for non-safety instrument air piping not meeting guidelines in Regulatory Guide 1.29, was never properly resolved.

Assessment of Allegation: The thrust of the concern is the question of whether guidelines provided in Regulatory Guide (RG) 1.29 were considered during instrument air piping and tubing design and whether the failure of the instrument air piping and tubing, or their supports, could degrade any safety equipment or tubing during a Safe Shutdown Earthquake (SSE).

Regulatory Positions 2 and 3 of Regulatory Guide 1.29 "Seismic Design Classification" Rev. 3, September 1978 and Rev. 1, August 1973, states that non-safety structures, systems, or components whose failure could reduce the functioning of any plant feature to an unacceptable safety level or whose failure could result in incapacitating injury to occupants of the control room, should be designed and constructed so that the SSE would not cause such failure.

Seismic Category I design requirements should extend to the first seismic restraint beyond the defined boundaries. Those portions of structures, systems, or components that form interface between Seismic Category I and non-Seismic Category I features should be designed to Seismic Category I requirements.

Therefore, non-seismic installation is permitted, provided certain design considerations are followed.

From a review of a number of EBASCO drawings, it was confirmed that the Waterford instrument air system is not safety-related and that the tubing/piping is installed as non-seismic in areas with safety-related equipment, such as the auxiliary building and containment building.

A review of the Waterford 3 Final Safety Analysis Report (FSAR) confirms that the instrument air system is not needed for plant safety, and that the proper considerations for R.G. 1.29 and non-seismic installations were included in the design (FSAR Section 9.3.1).

Complete loss of instrument or service air during full power operation or under accident conditions does not reduce the ability of the reactor protective system or the engineered safety features and their supporting systems to safely shut down the reactor or to mitigate the consequences of an accident.

Since the compressed air system serves no safety function, this system is not designed to any safety class or seismic requirements. The portion of instrument air and service air piping and valves penetrating the containment building is designed to safety class 2 and seismic Category I requirements (refer to Subsection 6.2.4). The containment building instrument air header outer isolation valve is designed to fail closed. The containment service air outer isolation valve is locked closed because no compressed service air is required in the containment during normal plant operation.

Accumulators are provided on those valves where instrument air is required for operation during the safe shutdown of the plant following an accident or to mitigate the consequences of an accident. The accumulators are designed to seismic Category I requirements.

FSAR Section 3.2-1 "Seismic Classification," states:

> "The seismic classifications are consistent with the recommendations of Regulatory Guide 1.29, "Seismic Design Classification", August 1973, with a clarification noted in Table 3.2-1 for the reactor coolant pump bearing oil and cooling systems."
>
> "For systems which are partially seismic Category I, the seismic Category I portion includes all components within the seismic boundary and extends to the first seismic restraint beyond the boundary."
>
> "Non-seismic structures, systems and components are those whose failure would not result in the release of significant radioactivity and would not prevent reactor shutdown or degrade the operation of Engineered Safety Feature Systems. Their failure may, however, interrupt power generation."
>
> "The occurrence of adverse interaction between safety and non-safety-related components during SSE events are eliminated by adherence to the following:
>
> a) Whenever practical, the safety related components are separated from the non-safety-related components to ensure that failure of the non-safety-related component due to a SSE will not result in loss of function to the safety related components.
>
> b) In those areas where adequate separation is not possible, the non-safety-related components are provided with seismic supports, or barriers are provided between the safety-related and non-safety-related components.
>
> Where only portions of systems are identified as seismic Category I, the boundaries of the seismic Category I portions of the system are shown on the piping and instrument diagrams in appropriate sections of this FSAR."

This information indicates that the guidelines in Regulatory Guide 1.29 were taken into consideration at the time of instrument air piping and tubing design. It is also apparent that the potential for functional degradation of safety equipment or tubing during SSE due to instrument air piping and tubing failure was similarly addressed in the design.

The NRC staff also queried LP&L regarding the possibility of gravity missiles, from the failure of non-seismic instrument air piping and tubing physically degrading any safety equipment or tubing in the containment building during a SSE. In response to this question, LP&L identified a number of design criteria,

procedures and controls which have been implemented, or were to be implemented, to avoid damage to safety-related equipment from potential gravity missiles inside the containment building. These included:

1) Structural steel inside the containment building is designed for a SSE.

2) Electrical equipment including cable trays and conduit, inside the containment building is seismically supported, except for lighting and communications conduit. A verification will be performed in the field to ensure that a failure does not endanger safe shutdown equipment.

3) The only H&V duct inside the containment building not seismically supported is located in the containment sump pump compartment where no safety-related equipment is located. All other H&V ducts and equipment are seismically supported to prevent gravity missiles.

4) Non-seismically classified support piping has been routed away from safety-related equipment. A verification will be performed in the field after installation of equipment and piping.

The staff requested that LP&L provide documentation of the field verification of the above controls. From the additional information provided, it appeared that the follow-on verification was performed (inside the containment and the auxiliary and fuel handling buildings); however, it was not clear to the staff what specific non-seismic equipment (including the instrument air system) was verified. The staff could not determine if the issue of the air system's physical failure was adequately considered.

Based on the information provided from the field verification (walkdown), it appeared that insufficient documentation was included in the walkdown to draw a conclusion that the physical failure of the air system was adequately considered.

This issue could have some safety significance, but based on the previous walkdown the applicant should show that the safety significance is minor. This allegation also has generic implications because other non-seismic equipment (other than the air system) will also need to be addressed. This issue shall be addressed prior to exceeding 5% power.

Actions Required: See Item No. 18 in the Enclosure to the letter from D. Eisenhut to J. M. Cain (LP&L), dated June 13, 1984.

Task: Allegation A-226, A-306b, A-306f, A-306o, A-306p

Characterization: It is alleged that the traceability requirements of permanent attachment material welded to Class 1 and 2 piping pressure boundaries by Tompkins-Beckwith (T-B) were not satisfactorily resolved by EBASCO Engineering.

Assessment of Allegation: In assessing this allegation, the NRC staff reviewed LP&L's Preliminary Safety Analysis Report (PSAR) and the Final Safety Analysis Report (FSAR), as well as the appropriate sections of the EBASCO contract documents. The staff found that design of piping systems is based on LP&L's commitment to the Winter 1972 Addenda in Section III of the ASME Code. Since welded attachments are not pressure-retaining components, the only Code requirement is that the attachments must be made of materials permitted by the applicable ASME Code section.

Code Class 1 welded attachments need be in conformance with material specifications in subsections NB-2121 and NB-4435 of the Code. Certified Material Test Reports (CMTRs) are required and are included in the piping documentation package.

Code Class 2 welded attachments need be in conformance with material specifications in Appendix I, Table I-7.0, of subsections NC-2190 and ND-2190 of the Code. CMTRs or Certificates of Compliance (C of Cs) are required and are included in the piping documentation package.

The NRC staff determined that either CMTRs or C of Cs for permanent attachment material were included in piping documentation packages. Accordingly, the NRC staff concludes that the material traceability requirements of welded attachments to Class 1 and 2 pressure boundaries have been properly resolved and that the requirements of 10 CFR 50, Appendix B are met. In addition, these weld attachments were inspected by an Authorized Nuclear Inspector.

This allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-227

Characterization: It is alleged that a recommended system for identifying and dispositioning nonconformances was written by an EBASCO employee for seismic Category I supports but was rejected by EBASCO management.

Assessment of Allegation: The implied significance of this allegation is that EBASCO's nonconformance system for seismic supports may have been inadequate and that nonconformances may not have been properly identified and dispositioned which render the quality of the supports as indeterminate.

The NRC staff evaluated Mercury Construction Company procedures for controlling nonconformances to determine the adequacy of the system, and to determine if there was a compatible system in place such as that recommended by the former employee. The staff also interviewed EBASCO personnel who were involved in the review, audit, inspection, disposition, and closure of Mercury nonconformance reports (NCRs).

In its review of Mercury procedures, the NRC staff found that the former EBASCO employee's recommended procedure had not been specifically incorporated, and that no subsequent changes were made to the nonconformance system. Mercury Procedure SP664 required the writing of NCRs when necessary.

The NRC staff also interviewed personnel who were involved in Mercury nonconformance activities. The staff found that Mercury's system did not include any type of nonconformance document (such as a discrepancy notice (DN)), other than an NCR, for a suspected nonconformance. Only NCRs were entered into the system; this caused many more NCRs to be issued than were actually necessary. This use of NCRs, rather than DNs or other types of reports, was supported by the statements in procedure SP664 which stated, "The reporting of nonconformances shall not be limited to QA/QC department. Whenever a suspected nonconformance is discovered, it shall be the responsibility of the individual or department to initiate a nonconformance report." [Emphasis added.]

In the interviews, the NRC staff also found that, to assure proper disposition, a 100 percent review based on EBASCO NCR W3-7317 was performed on Mercury NCRs that had been dispositioned "use-as-is." During system turnover, NCRs were also reviewed as part of the turnover packages.

The NRC staff believes the responsibility and decision to accept or reject an employee suggestion on a procedure was the option of management. EBASCO and Mercury management made the decision not to accept the EBASCO employee's suggestion for a new procedure. The NRC staff found the nonconformance system used by EBASCO and Mercury acceptable.

This allegation has neither safety significance nor generic implications.

The NRC staff also reviewed other allegations related to Mercury NCRs. See the staff assessment of Allegation A-232.

Actions Required: None.

Task: Allegations A-229, A-306g

Characterization: It is alleged that an individual was directed to turn over operational control records (OCR) packages [system startup quality assurance (QA) records] before system reviews were completed, and that the resulting documentation and hardware discrepancy lists submitted to LP&L documented inadequate reviews.

Assessment of Allegation: The implied significance of this allegation is that if inadequate reviews of turnover documentation packages were performed, the acceptability of safety-related systems may have been affected.

The NRC staff examined an EBASCO interoffice memorandum which provided package turnover status. The staff interviewed EBASCO and LP&L personnel involved with the Mercury turnover documentation program, and examined the discrepancy list identified in the EBASCO memorandum to determine if referenced corrective action was documented. Also, the NRC staff reviewed a sample of Mercury SUS turnover packages to verify that deficiencies noted by EBASCO Quality Assurance Installation Review Group (QAIRG) had been adequately resolved.

The EBASCO interoffice memorandum provided the status of five SUS documentation packages prior to turnover the LP&L. The topics included EBASCO and Mercury integrated SUS turnover package review for approved checklists; training of Mercury and EBASCO personnel for parallel review; and a notation that the five SUS packages reviewed were missing preliminary as-built (PAB) drawings (PABs represented the as-built configuration). Also, two SUS turnover packages that were given to the EBASCO startup group were identified as not being reviewed against the PAB, and that the EBASCO startup group had rejected the two packages and caused all five SUS packages to be rereviewed using the PABs as baseline documents.

The NRC staff interviewed LP&L and EBASCO personnel, including the addressee of the EBASCO interoffice memorandum, involved with Mercury and EBASCO reviews of turnover packages. The staff found that, between December 1982 and February 1983, there was a change in the Mercury and EBASCO interface as to parallel and individual company documentation review. There was some confusion between Mercury, EBASCO, and LP&L reviews, and, as noted in the EBASCO memorandum, two SUS packages were submitted to EBASCO startup group without being evaluated against PABs. The EBASCO startup group rejected the packages, which caused re-review by Mercury and EBASCO QAIRG. The NRC staff believed this to be a good example of quality assurance system checks and balances working effectively to maintain system effectiveness.

The NRC staff could not locate the discrepancy lists for the two systems alleged to have been reviewed without PABs. However, LP&L did provide the staff with original turnover deficiency and status documents received by LP&L from EBASCO QAIRG. These records identified that Mercury and EBASCO reviews were performed using PABs as the baseline documents. After reviewing these current records, the NRC staff found no procedural violation.

Ten Mercury generated SUS turnover packages were reviewed by the NRC staff. The objective was to verify that Mercury and EBASCO documentation review did cover technical adequacy, completeness, and authenticity. The staff concluded that Mercury and EBASCO QAIRG reviews were adequately accomplished and

documented. In addition, the NRC staff performed walkdowns for 19 instrumentation installations and found no problems. For further details, see the NRC staff assessments of Allegations A-188/A-190/A-191/A-193, A-35, and A-308.

The NRC staff found that Mercury, EBASCO, and LP&L had implemented adequate control of SUS turnover package reviews. This allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-230

Characterization: The allegation is that an EBASCO review of Startup System (SUS) 52B, Reactor Coolant System , found many Mercury documents that were incomplete and red lined on drawings that did not match the as-built plant configuration. This allegation also claimed that there were generic deficiencies in Mercury turnover packages.

Assessment of Allegation: The implied significance of this allegation is that missing or inadequate documentation and incorrect red lined drawings could place the quality of installation in question.

The NRC staff investigated this allegation by reviewing four of the six safety-related Operation Control Reports (OCRs) associated with SUS 52B and five OCRs for other systems. EBASCO reviewed 100% of the OCRs prior to Mercury turnover of the packages and LP&L performed a 10% sample review. The NRC staff found that Mercury, EBASCO, and LP&L reviews were documented on completed checklists and various other forms in the turnover packages. QA documentation deficiencies were identified on EBASCO DRs and resolved. (See Allegation A-05).

The issue involving problems with red lined drawings was addressed by Allegation A-187, for which the NRC review identified no problems.

The NRC staff concludes that this allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegations A-232, A-234, A-237, A-238, A-243, A-244, A-245, A-262, A-311, A-312, A-313, A-316, A-317, A-318, A-320, A-321, A-323, A-324, A-325, A-326, A-327, A-328, and A-331

Characterization: It is alleged that the Mercury, and to a lesser extent the EBASCO, nonconformance systems did not: (1) properly identify nonconforming components; (2) prevent the installation of nonconforming materials, parts, and components; (3) provide for the proper disposition of nonconformances; (4) give Quality Assurance (QA) personnel the freedom to write nonconformances; and (5) assure that corrective actions were adequate.

Assessment of Allegation: The implied significance of this allegation is that the installation of safety-related systems could be questionable.

Although this allegation appeared to be generic, the large number of specific examples provided to the NRC staff indicated that these problems were related only to certain activities. Some allegations were also related to charges that discrepancy notices (DNs), deficiency reports (DRs), field change requests (FCRs), design change notices (DCNs), and speed letters were used to circumvent the requirement for nonconformance reports (NCRs).

In evaluating this allegation, the NRC staff:

(1) Reviewed Mercury and EBASCO procedures for processing NCRs, and examined the NCRs identified by the allegers to determine if they were properly dispositioned and to determine if corrective action was taken; and

(2) Interviewed Mercury, EBASCO, and LP&L quality engineers involved in the NCR system.

The NRC staff reviewed each NCR identified by the allegers to determine how adequately it was reported, reviewed, and dispositioned. These NCRs were further examined for generic problems which could affect other safety-related systems.

The NRC staff found the following with respect to each specific allegation:

1. Allegation A-232 - It was alleged that EBASCO NCR W3-4352 was improperly dispositioned in order to meet ASME Code requirements and ANSI standards and dispositioned "use-as-is." The NRC staff reviewed the disposition of the NCR and concluded that the corrective action taken for closure was appropriate.

2. Allegation A-237 - Examples of some NCRs were provided which were alleged to be examples of "things not properly handled." Additionally, it was alleged that most Mercury NCRs were not properly addressed or closed.

The NRC staff reviewed between 125 and 150 Mercury NCRs. Of these, the staff found that 19 NCRs had questionable or improper dispositions; they were as follows:

Mercury NCRs

313, 322, 337	Identified seven ½" stainless steel lines for P2 instruments that were damaged by weld spatter. The NCR stated that the lines were replaced and documented as such in operational control record (OCR) 995 and OCR 1020, but it could not be ascertained from these rework packages that the repair and reinspection was either started or completed. There was no documentation with these NCRs to prove that corrective action was completed.
363	Indicated a problem with fitup of emergency diesel generator fuel oil tank "A." This was a safety-related system; therefore, an authorized nuclear inspector (ANI) review should have been performed, but was not.
554	Noted numerous problems with supports during a walkdown. There was no proof of work being performed to correct these problems other than a memo (Form 211) stating that work was performed.
658	Identified problems with OCR 1671 seismic Category I support, B-430-x23-J-42. The NCR stated "the disposition has been completed, all rework documented." There was no other documentation in the package other than the NCR W3-7317 acceptance letter.
572	Noted that the weld on support location #26 was undersized. The NCR stated that the weld was reworked and weld metal added to bring weld to sufficient size. There was no reference as to what OCR was issued to perform this rework or traceability of weld metal used in the performance of this job. Also, there were no inspection reports identified or contained in the package.
673-678	These NCRs were closed out by the statement: "Administratively closed B31.1 to be tracked and resolved by Mercury Engineering Department." This resolution was unacceptable as the requirements of 10 CFR 50 Appendix B apply to safety-related installations as committed to by LP&L. (Also, all of these NCRs were reviewed by EBASCO under NCR W3-7317 and accepted "as-is.")

673 Identified problems with instrument tubing installed by OCR #723.

674 Identified problem with the electromagnetic control panel worked by OCR #1246.

675 Identified problems with instrument tubing installed by OCR #720.

676 Identified problems with instrument tubing installed by OCR #720.

677 Identified problems with instrument tubing installed by OCR #1332.

678 Identified problems with instrument tubing installed by OCR #723.

888 Indicated problems with personnel qualifications; e.g., "Several QC [quality control] type personnel have been certified level II without documented indications of qualification requirements per QCP 3110 paragraph 1.4 and ANSI N45.2.6." Recommended disposition was marked "N/A" yet the recommended disposition completed stated "This NCR not processed: 1) Initiator not a Mercury employee at time of writing; 2) QCP 3110- . . . does not apply to W3; 3) ANSI N45.2.6 previously incorporated by QCP 3050 is approved. All M Co. QC techs are trained and tested per QCP 3050 prior to performing inspection or tests."

889 Indicated problems dealing with piping supports installed by Mercury in that the installed hangers were different than those noted in Mercury's QC support installation documentation. As with NCR 888, the recommended disposition was marked "N/A" and the recommended disposition was completed by saying "This NCR not processed: 1) Initiator not a M Co. Employee at time of writing; 2) . . . "

2234 Stated that no heat numbers could be verified between FW13 and FW13R. This is for OCR 666, System 52B. The recommended disposition was per attachment #4 of NCR W3-4593.

3149 Indicated that there was no documented indications that welder M-343 was qualified to welding procedure specification D (WPS-D). Disposition of this problem was by use of a weld test coupon subsequently found on April 27, 1983, but no longer available. No documentation existed on the qualification of this welder or on his retest. Thus, all welds made by this welder were suspect.

Generic Problems with NCRs

- The validity of several dispositions were questionable because the referenced letters used to close these NCRs did not adequately address them.

- Several Mercury NCRs identified that discrepancies existed between drawings and documentation. The solution to this problem was to modify the documentation so that it "agreed with what was installed in the field." The

adequacy of design was also questionable because of a lack of indications that a design review was performed by Mercury Engineering.

- o Some NCR dispositions and QA reviews performed by Mercury did not have sufficient documentation to justify those actions and reviews.

3. Allegation A-238 - It was alleged that Mercury Corrective Action Report (CAR) No. 129 of December 13, 1982, was not handled correctly because the actual problem raised was evaded. The NRC staff reviewed this issue and determined that CAR-129 was reviewed by EBASCO and subsequently upgraded to NCRs W3-5669 and W3-5671. These NCRs were dispositioned and closed on February 18, 1983. The staff concluded that this CAR was dispositioned properly and that this allegation has neither safety significance nor generic implications.

4. Allegation A-234 - It was alleged that many Mercury NCRs were improperly dispositioned and never received EBASCO NCR numbers. While conducting its general review of Mercury NCRs and the NCRs identified in the allegations under A-237, the NRC staff sampled between 125 and 150 of these NCRs to determine if there were Mercury NCRs which should have been elevated to EBASCO NCRs and were not. In conducting its review, the staff found that EBASCO had issued NCR W3-7317 (October 26, 1983) to disposition the violation of Mercury Procedure SP-664 in that when a Mercury NCR was dispositioned "use as is," the Mercury QA Supervisor elevated the applicable NCR to EBASCO. The NRC staff found that this NCR was closed on December 1, 1983, after a 100 percent review of Mercury NCRs had been conducted. During this review, EBASCO found that 437 Mercury NCRs had been dispositioned "use as is" and had not been reviewed by EBASCO. An EBASCO team composed of QA and construction engineering personnel reviewed these and either concurred in or rejected the dispositions. The disposition of 36 NCRs was rejected by EBASCO and these were subsequently elevated to EBASCO NCRs. The NRC staff reviewed them and a portion of other Mercury NCRs to determine if there were any marked "use as is" which were not captured by EBASCO's review team and to determine for those dispositioned "use as is" whether they had been elevated to EBASCO NCRs. The staff's findings were that the review conducted by EBASCO appeared to have been adequate in that there were no NCRs out of the sample examined dispositioned "use as is" which nad not been reviewed by EBASCO and that none were found which were dispositioned "use as is," which should have been elevated to EBASCO NCRs and had not been. This concern has neither safety significance nor generic implications.

5. Allegation A-243 - The allegation concerned a phone conversation on November 15, 1982, between a Mercury QA Document Reviewer and an employee of the Magnaflux Company about the proper method of obtaining successful magnetic particle test results. The NRC staff reviewed this concern and determined that the events discussed during the conversation violated neither test codes nor procedures. Therefore, the disposition of the Mercury NCRs addressing this problem was proper. This concern has neither safety significance nor generic implications.

6. Allegations A-244-245 - It was alleged that multiple nonconformance reports were not dispositioned correctly. The NRC staff reviewed Mercury NCRs 996, 399, 854, 867, 922, 950, 889, 888, 952, 960, 990, 995, 1025, 1042, and 1027 concurrently with Allegation A-237.

7. Allegations A-311-312-313 - These allegations were that EBASCO NCR W3-4593 (Mercury 881) was not properly dispositioned in that LP&L was not transferring heat numbers to as-built drawings; that LP&L was not transferring all possible heat numbers when they did make transfers; and that heat number charts used for tracking heat numbers were difficult to interpret and were incorrect. The NRC staff investigated this allegation during its general review of EBASCO NCRs. EBASCO NCR W3-4593 was reopened February 16, 1984, with the recognition that approximately 25 percent of tubing installed could not be directly traced to certified material test reports (CMTRs) or certificates of compliance (C of Cs). This review was also conducted because additional heat numbers for instrument tubing which may have been a part of the Mercury installation were identified. The final disposition (on March 23, 1984) of this NCR was that direct heat number traceability was not required for Mercury tubing installation. The disposition also stated that Mercury did not have a materials control program meeting the requirements of ASME Code Section III or 10 CFR 50, Appendix B, Criterion VIII. This NCR was further dispositioned by requiring Mercury to install materials required by design based on general site controls. However, the NRC staff, in its review, concluded that because of the lack of heat number traceability, section(s) of non-safety tubing issued simultaneously with safety-related tubing of similar size could have been installed as safety-related tubing. Therefore, the staff is not confident that what is supposed to be installed as safety-related tubing is in fact safety-related tubing. Further, both Mercury's lack of a materials control program, and their having traceability to only the warehouse, do not meet ASME Code requirements or 10 CFR 50, Appendix B, Criterion VIII.

8. Allegation A-316 - The allegation was that a draft NCR improperly dispositioned a problem with the thickness of stainless steel tubing. The NRC staff reviewed EBASCO NCR W3-7538 and found it to be properly dispositioned. The tubing in question was ultrasonically tested to determine tubing wall thickness. All tubing was found to have the appropriate wall thickness. Thus, all safety concerns were resolved.

9. Allegation A-317 - The allegation was that draft Mercury NCR 1830/NCR 806 was improperly closed. The NRC staff review of EBASCO NCR W3-7547 revealed that there were disposition problems. For specific details, see Allegations A-33 and A-55.

10. Allegation A-320 - The allegation concerned a draft NCR on Mercury instrumentation supports. The NRC staff review of EBASCO NCRs W3-6514, W3-3941/R1, and W3-5819 revealed that the concern addressed by this allegation was discussed in these EBASCO NCRs. (See Allegation A-33.)

11. Allegation A-321 - The concern over a draft NCR on Mercury Procedure SP-664 was addressed in EBASCO NCR W3-7317. The NRC staff determined that NCR W3-7317 was dispositioned properly and that it resolved the problems addressed.

12. Allegation A-323 - The allegation was that hold tags for Mercury NCRs 2663 and 2665 were removed illegally or prematurely. This allegation was reviewed by the NRC staff who noted that these NCRs were upgraded to EBASCO NCRs W3-5879 and W3-5881, respectively. The documentation indicated that the field welds were increased to the required dimensions and successful NDE results were obtained. The staff could find no indications that hold tags were removed illegally or prematurely.

13. Allegation A-324 - The allegation was that EBASCO NCR W3-3894 might have to be reopened to address weld data report deficiencies. The NRC staff reviewed this NCR and concluded that it was dispositioned properly and that all safety concerns were resolved.

14. Allegation A-325 - The allegation was that Mercury NCR 3557 was improperly dispositioned. This allegation concerned over-pressurization of instrumentation lines during hydrostatic testing. The NRC staff reviewed this NCR and discovered that Mercury NCR 3557, along with NCR 3438, were upgraded to EBASCO NCR W3-6440. The EBASCO NCR was dispositioned by reviewing stress limits of components within the test boundaries. No stress limits were exceeded. The staff concluded that the disposition of the item was proper and that it had neither safety significance nor generic implications.

15. Allegation A-326 - This allegation concerned proposed stop work orders and was addressed by the NRC staff during its review of Allegations A-311, A-312, A-313, and A-315.

16. Allegation A-327 - The concern of NCR W3-6159 was addressed in the evaluation for Allegations A-33 and A-55.

17. Allegation A-328 - This allegation concerned the EBASCO Site Support Engineering (ESSE) review of hardware-related NCRs and was reviewed by the NRC staff. This concern was evaluated when the NRC staff reviewed Allegations A-33 and A-55 when it was discovered that EBASCO NCR W3-7317 was properly dispositioned and closed out.

18. Allegation A-331 - This allegation concerned the improper closure of NCRs and has been evaluated in the NRC staff review of Allegations A-33 and A-55.

19. Allegation A-318 - The concern over Mercury hold tag installation and retrieval, as identified in interoffice correspondence W3-QA-26547, was reviewed by the NRC staff. The initial audit described in correspondence W3-QA-26547 revealed five of the ten NCRs audited had missing hold tags. In response to this problem, LP&L reported they had located eight of the ten NCR hold tags; two were assumed to be lost.

20. Allegation A-262 - This allegation was that welder qualifications were falsified, and it has been evaluated in the NRC staff review of Allegation A-215.

21. Nonconformances and Corrective Actions - QAM Section 12 and SPP-664, Revision 4, requires that an NCR be written "When the suspected nonconforming material, items, and services are determined by the QA Manager to be

nonconforming, . . . " The NRC staff determined that draft nonconformance reports (NCRs) submitted to the QA manager could be rejected or voided by him as allowed by the procedure. It was, however, found that draft or voided NCRs were not being retained as QA records. Therefore, the disposition or justification for rejection was not auditable because the draft or voided NCRs were destroyed. The NRC staff interviewed former Mercury and other site personnel who had direct knowledge of the NCR system. They acknowledged that such a system may have impeded project personnel from processing NCRs. An LP&L QA engineer stated that LP&L had addressed this problem when Mercury management was supplemented by EBASCO in 1982. Mercury personnel were then encouraged to write NCRs and as a result the number increased from several hundred to more than 3000. This happened when about 80 percent of Mercury's work had been completed. However, the NRC staff commented that this increased NCR activity would not necessarily solve the problem of failure to process or document rejection or voiding of draft NCRs that were submitted by personnel who left the site prior to LP&L's initiation of this policy.

In conclusion, the NRC staff found that the inadequate disposition of Mercury NCRs and improper voiding of NCRs is a safety significant issue and has potential generic implications for the Mercury NCR system. This issue will require action on the part of LP&L.

Actions Required: See Item No. 6 of the enclosure to the D. Eisenhut letter to J. M. Cain dated June 13, 1984, and the D. M. Crutchfield letter to J. M. Cain dated September 19, 1984.

Task: Allegation A-242

Characterization: The allegation is that hydrostatic tests were performed without the use of highpoint vents. This allegation raised additional concerns about the adequacy of instrument tubing installations relative to sloping requirements.

Assessment of Allegation: The NRC staff's review of LP&L's Final Safety Analysis Report (FSAR) and applicable procedures revealed that all hydrostatic tests were to conform to the requirements of ASME III, Classes 2 and 3, 1974 Edition, Summer 1976 Addenda, Article NC-6000, "Testing," which requires that "vents shall be provided at all highpoints of the component or system in the position in which the test is to be conducted, to purge air pockets while the component or system is filling." This requirement is restated in EBASCO Procedure ASP-IV-63 Section 7.4.4. The use of highpoint vents during hydrostatic testing was indeed a requirement, based upon an FSAR commitment to the applicable testing section of the ASME Code. It should be noted that a later revision to this section of the code on "Testing," deleted the specific requirement for high point vents and was revised to state that "The component or system in which the test is to be conducted shall be vented during the fill operation to minimize air pocketing.

The NRC staff examination of 27 hydrostatic document test packages, including the applicable valve lineup sheets and isometrics, revealed that for each of the corresponding hydrostatic tests, highpoint vents had not been used. The staff also reviewed Field Change Request FCR-1CP-19, Rev. 2. This document, issued August 6, 1980, deletes the use of highpoint vents. An examination of the hydrostatic test index reveals that all Waterford Unit 3 hydrostatic tests had been performed on dates subsequent to the issuance of the field change request (FCR), and would therefore have been performed in accordance with its requirements.

During the NRC examination of the hydrostatic test packages, it was observed that each of the 27 packages contained a "Test Instructions" sheet, which instructs workers to "Fill lines with root valve open until you can hear water running into the process pipe, then close the root valve." This instruction was found only on the test instructions sheet, and not as part of the approved procedures for performance of hydrostatic test. Discussions with LP&L revealed that this instruction was their preferred method of venting the system to be tested, and that this was an appropriate means of assuring that the system under test is full.

Although LP&L failed to implement the requirement for use of highpoint vents during hydrostatic tests, NRC considers the alternate method of venting systems through the root valve to the process line sufficient to preclude an invalidation of hydrostatic tests. Since a primary function of any hydrostatic test is to assure the integrity of the system tested, the verification of test parameters, such as pressure and time, and the required physical inspection of components comprising the system, are essential keys to providing assurance of successful completion. The staff examination of the test data reports indicated that quality verification of these parameters had been accomplished. However, the staff was concerned about the effects an improperly vented system may have on the instruments performing an operational function. In particular, the affects of air entrapment upon instrument time response characteristics.

This matter was discussed with LP&L personnel, who indicated that LP&L Maintenance Procedure MI-4-315, "Blowdown and Backfilling Instrument Impulse Lines," had been developed to alleviate any problems in this area, and that if, during operation, installations are identified which are susceptible to air entrapment, they will be reworked to correct the problem. A review of Sections 8.1 through 8.3 of this procedure revealed that appropriate controls had been established to minimize air entrapment.

A related issue of this allegation concerns the adequacy of instrument tubing installations in view of the elimination of slope requirements by engineering analysis. A staff review of EBASCO letter LW3-1191-82 revealed that in general it was LP&L's position that slope deviations have no effect on instrument function.

This documented position could be interpreted to be a generic acceptance of slope deviations. However, the NRC staff review of the applicable specification and procedures revealed that slope requirements of one-fourth inch per foot were consistently specified, and the review of an EBASCO memorandum of September 28, 1982, indicated that ESSE will continue to review each nonconformance report that identified a questionable slope in tubing installations. To confirm this, the staff examined 54 Mercury nonconformance reports. Each NCR examined that cited slope deviations was initiated between August 30, 1982, and May 31, 1983. The staff observed that disposition of slope deviations had been performed on a case-by-case basis. Dispositions included rework, use-as-is, or a combination of these categories. Many slope deviations were those which involve inadequate slope; that is, a slope which was less than the specific one-fourth-inch per foot, or no slope, indicating a level line.

In some instances, however, slope deviations exhibited negative or reverse configurations. NRC reviewed the dispositions for these conditions. Several installations were required to be reworked; however, a significant number were dispositioned use-as-is. The technical justification for this disposition was based on case-specific analysis. Consideration of variables, such as operating pressure, line configuration and instrument function, were evaluated by the engineer in determining the acceptability of each installation. In summary, NRC observed that deviations in instrument tubing slope requirements had been consistently documented and evaluated by the applicant.

The NRC staff found that the applicant had failed to comply with FSAR and procedural commitments for the use of highpoint vents during the performance of hydrostatic test. However, the alternative method employed by the applicant is considered satisfactory to the NRC staff and its effect upon the adequacy of hydrostatic testing is not considered significant. These findings were discussed with the alleger.

In addition, NRC finds no indications that would indicate that slope requirements had been generically eliminated from design, construction, or inspection processes.

This allegation had neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-249

Characterization: It is alleged that EBASCO Discrepancy Notices (DNs) were written and given to sub-contractors who would process the DNs through their own Engineering/Quality Assurance (QA) personnel and would then either change the documentation or walk down a system to eliminate the discrepancy at which time the DNs would be "trash canned".

Assessment of Allegation: The implied safety significance of this allegation is that improperly processed EBASCO DNs and lack of adequate corrective action could cause the quality of installation to be questionable.

The NRC staff reviewed EBASCO DN control procedures for adequacy and indications of implementation, and reviewed EBASCO DN logs and files for completeness. The staff interviewed personnel involved with the processing of DNs, and selected and reviewed approximately 20 DNs related specifically to system numbers 36 (Component Cooling Water), 52a (Reactor Coolant), and 60 (Safety Injection). Some were for a time period in 1981.

The NRC staff review revealed the following:

1. EBASCO procedures addressed the initiation, processing, logging, resolution, reviewing, reporting, and filing of Discrepancy Notices (DNs). These procedures were adequate for the control of DNs.

2. The DN logs and files in both the Quality Material Control, Construction Quality Control areas, and the EBASCO QA vault were found to be in order with the DN numbers all in sequence. There were no missing or lined out DNs that were unaccounted for. The files also had no DNs that were missing.

3. The personnel that were procedurally responsible for the implementation of the DN system, were interviewed by the NRC staff and found to be knowledgeable and conscientious about their responsibilities.

4. The random selection of approximately 20 DNs were reviewed by the NRC staff and found to be properly closed, by a specific action or by reference to an NCR number, with appropriate signatures.

Additionally, DNs were being entered into the EBASCO tracking system to assure an adequate status was maintained.

In conclusion the NRC staff determined that EBASCO's procedural content and implementation of the DN system was adequate, that all DNs were accounted for, and that adequate corrective action was taken. This allegation had neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-252

Characterization: It is alleged that EBASCO interoffice letter W3-QA-23661 (March 4, 1983) was "an example of correspondence written to cover up problems discovered in the documentary group."

Assessment of Allegation: During the spring of 1982, EBASCO established a Quality Assurance Independent Review Group (QAIRG) to review the status of the documentation furnished by project subcontractors. One group was responsible for the documentation associated with the installation of Tompkins-Beckwith (T-B) piping hangers. During their review, QAIRG members asked questions about the details of their document review. To provide consistent answers to these questions and to give guidance to new QAIRG members, EBASCO management issued W3-QA-23661 on March 4, 1983.

To provide continuity of direction, the letter was jointly written by the EBASCO Manager of the Site, the EBASCO Manager of Information Records, the T-B Quality Assurance (QA) Site Supervisor, and the T-B Engineering Manager. The letter, prior to release, was reviewed and verbally approved by the LP&L Site QA Manager.

The alleger feels that EBASCO management may have attempted to solve problems by dictating solutions rather than by using the established discrepancy reports or nonconformance reports.

The NRC staff reviewed the letter and found no instance of an attempt to provide answers or solutions outside the established QA system. Thus, there was no indications to support the alleger's claim of a coverup.

This allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegations A-253, A-254, A-257

Characterization: It is alleged that Vendor Records Reviewers were not qualified to assure requirements were met, and that some vendor records were bad, particularly those for Bergen-Patterson, a subcontractor of Dravo.

Assessment of Allegation: The implied significance of the allegation was that QA records reviewed and approved by unqualified reviewers could place the records in question. Inadequate QA records for Bergen-Patterson components could place the acceptability of those items in question.

The NRC staff's methodology for reviewing the allegation was as follows: (1) the quality records supervisor was interviewed; (2) the appropriate quality assurance procedures were reviewed; (3) the applicable purchase orders and specifications were reviewed; (4) applicable quality records packages for pipe supports were reviewed for compliance with the purchase order and specification; (5) EBASCO and NRC Audits of Bergen-Patterson Pipe Support Co. were reviewed; and (6) the EBASCO-approved Vendor List was reviewed.

For the details of allegations pertaining to Dravo and CB&I see Allegation A-292.

The NRC staff assessment of this allegation revealed that it was probably based on a lack of understanding of the responsibility of the quality records section. By procedure, the responsibilities of the quality records section was to check each quality records packages to assure that it was legible and complete. If a package was not complete or was illegible, a deficiency report was filled out, logged in the master tracking system, and issued for corrective action.

The primary responsibility for reviewing vendor records rested with vendor quality assurance representatives and the Project Quality Assurance Engineers, who were assigned to particular engineered components. In addition, when necessary, documents were sent to the engineering disciplines for review. For example, seismic analyses were reviewed by the appropriate seismic engineering discipline. An NRC staff sample review of quality records packages revealed that EBASCO Vendor Quality Assurance representatives were reviewing all documents, performing all required quality checks, and completing all reports legibly and completely. This was confirmed by the Quality Records review group. The results of an April 1982, inspection of Bergen-Patterson, by NRC was reviewed. The inspection covered the engineering and design functions of the Bergen-Patterson offices in Pittsburgh, Pennsylvania and reveales that Bergen-Patterson had an acceptable QA program covering design and engineering. The NRC inspection was indications that Bergen-Patterson's C of Cs were valid for engineering and design of pipe supports.

An NRC review of the EBASCO Approved Vendor List revealed that audits of all Bergen-Patterson facilities had been performed including the manufacturing facility at Laconia, New Hampshire. In addition, the approved vendor list showed that the Laconia facility possessed an ASME Code stamp (NPT)N-1217, which expires September 8, 1984. An audit of the Laconia facility dated January 1983 was also reviewed. The Audit covered the Bergen-Patterson QA program compliance with the purchase specification. The results of the audit demonstrated that Bergen-Patterson had a quality assurance program that meets

all requirements of the purchase specification. Sufficient indications was provided to verify that the manufacturing of pipe supports complied with the C of C.

In conclusion, the staff's review revealed that the allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-256

Characterization: It is alleged that Chicago Bridge & Iron (CB&I) had problems with protective coatings and material traceability for the inside of the containment vessel.

Assessment of Allegation: The NRC staff review of this allegation indicated that CB&I did not have available any documentation concerning material certification, painter certification, quality control (QC) certification, or work activity inspections.

The NRC staff's review of EBASCO Contract (No. NY-403405) with CB&I indicated that CB&I had no requirement that committed them to a quality assurance (QA) program for nuclear protective coatings. There was no documentation made available by CB&I on the basic materials which would support the acceptability of the coatings material or its application. The NRC staff was informed by LP&L that Carboline, the coating manufacturer, maintained material certification for coatings for only 5 years. It has been approximately 7-8 years since the initial application of coatings by CB&I to the containment vessel. Carboline gave only an oral statement to LP&L that the coating material purchased was acceptable for the intended service conditions.

The only documentation available for coatings applied to the containment vessel were the EBASCO QC surveillance inspection reports. However, there appeared to be no established method of documenting the coating work until flaking and delamination of Carbo Zinc 11 (Primer) occurred after post-weld heat treatment was completed by CB&I. The EBASCO corrosion engineer, CB&I, and Carboline held meetings and had discussions on the method of repair of the containment vessel; as a result, EBASCO QC monitored the coatings operation by CB&I on a daily basis from approximately August to December 1977. Inspection reports by EBASCO QA indicated that they inspected dry film thickness, ambient conditions, and surface cleaning and preparation.

Approximately 2 years later, Sline Industrial Painters, Inc., the paint contractor, identified areas with coating problems inside the containment vessel. Again, EBASCO corrosion engineers performed an onsite evaluation of the entire coating system inside the containment vessel . At this time a 100% inspection plan was initiated by EBASCO and LP&L. All defective areas were marked, and Sline repaired them using approved procedures in accordance with ANSI N101.2, N5.12, and N101.4.

There was some question about the integrity of the coating system applied by CB&I. To address these concerns, an in-situ design basis accident (DBA) test was conducted by Ken Tator Associates and EBASCO corrosion engineers on the inside of the containment vessel to verify the integrity of the coating system. The results of this test indicated that the protective coating system would remain intact during a DBA and would have no impact on safety.

The NRC staff's review of the allegation established that EBASCO's contract with CB&I did not require CB&I to commit to a QA program for interior coatings. Moreover, the staff's assessment revealed that LP&L had failed to fully review EBASCO's contract for a CB&I QA program for protective coatings for the inner surface of the containment vessel.

In addition, both the preliminary safety analysis report (PSAR) and the final safety analysis report (FSAR) commit to ANSI N101.2 and N5.12 (formerly N5.9 in the PSAR). LP&L submitted an FSAR change (Amendment No. 33, September 1983) and a potential 10 CFR 50.55(e) item concerning compliance with the above standards in regard to coating of the containment vessel plate (inside).

This allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-258

Characterization: It is alleged that Chicago Bridge and Iron Company (CB&I) did not maintain material traceability on certain seismic Category I structural components in the containment vessel that were fabricated from Class D materials.

Assessment of Allegation: Chicago Bridge and Iron Company (CB&I), fabricator of the containment vessel, used material they had categorized as Class D to fabricate certain nonpressure retaining structural components in the containment vessel. These structural components include seismic clips that support safety-grade class piping systems, parts of the equipment hatch handling device, parts of the personnel and escape locks, crane rails and girders, stairs, ladders, and some temporary attachments and components. EBASCO categorized these components as seismic Category I, a category requiring material traceability. But, according to CB&I quality assurance procedures, material traceability was not required for Class D material and thus was not maintained. Nonconformance Report (NCR) No. W3-6224, issued by EBASCO Quality Assurance Group on May 13, 1983, addressed this issue.

To resolve the material traceability problem, EBASCO contacted CB&I and requested that they conduct a search of their in-house records to establish traceability of these materials where possible. CB&I was able to provide Certificates of Compliance or Certified Material Test Reports which established material traceability for a large portion of the components. A listing of those components, which could not be identified as temporary, or for which material traceability could not be established through CB&I records, was forwarded to EBASCO Site Support Engineering (ESSE) for engineering evaluation. Based on their review, ESSE concluded that material traceability was not critical to the safe operation of the components, including bolting and angle iron connectors on stairs, platforms, and crane rails; the equipment hatch handling device; and parts of the personnel and escape locks.

ESSE pointed out that in the CB&I design of the containment vessel, the structural members were categorized in material Classes A through D reflecting their order of importance, Class A being the most important and Class D the least important. Thus, there was a conscious decision by CB&I regarding the materials classification of components. ESSE indicated that they had reviewed and concurred with the CB&I materials classification system.

The NRC staff reviewed the ESSE evaluation, including in the resolution of NCR W3-6224, and performed an independent assessment of the components with potential safety significance, specifically the equipment hatch handling device and the personnel and escape locks. The equipment hatch handling device is used for opening, closing, and storing the 14-foot diameter equipment hatch during maintenance operations, but is not relied upon to maintain containment integrity during normal or postulated accident conditions. The NRC staff concurred with the ESSE conclusion that material traceability is not essential for this component. The personnel and escape locks each have two gasketed doors in series with valve and interlock mechanisms so that containment integrity can be maintained during entry and exit. The NRC staff review of the bill of materials and drawings for the personnel and escape locks showed that the Class D materials in these components were used primarily in the fabrication of actuating mechanisms for valves and interlocks, and for miscellaneous items

such as valve handles, bolting, and indicator plates for which material traceability is not critical. The main concern regarding these components is operability and LP&L is required by the final safety analysis report and in their Technical Specifications to perform operability testing of the personnel and escape locks each time they are opened and at periodic intervals. This surveillance testing should provide adequate assurance that these components will perform satisfactorily.

Based on the review of the ESSE evaluation of this issue and on its own independent review and and evaluation, the NRC staff concluded that the traceability issue for Class D material used in the containment vessel as addressed in NCR W3-6224 has been satisfactorily resolved through the actions taken in the resolution of that NCR.

One issue with possible generic implications is that EBASCO did not perform a comprehensive, initial review of the contractor's (CB&I) procedures to determine that they were consistent with EBASCO specifications. Vendor and contractor QA procedures should have been reviewed to ensure that they were consistent with the prime contractor's specifications and quality assurance program. Although a failure in the quality assurance program in effect initially did occur because of inconsistency between documents was not identified, the same program through internal review identified the material traceability issue. NCR 6224 was written and no violation of NRC regulations was identified.

This allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-259

Characterization: It is alleged that "Class D" material used by Chicago Bridge and Iron (CB&I) in the fabrication of certain non-pressure bearing structural components inside the containment building was not welded with traceable weld rod and that the welds are not traceable to a specific welder.

Assessment of Allegation: This allegation is related to Allegation A-258 regarding the traceability of materials categorized by CB&I as Class D that were used in the fabrication of certain non-pressure bearing structural components in the containment vessel. As described in the assessment of Allegation A-258, these structural components included seismic clips that support safety-class piping systems, parts of the equipment hatch handling device, parts of the personnel and escape locks, crane rails and girders, stairs, ladders, and some temporary attachments and components. EBASCO categorized these components, with the exception of temporary items, as seismic Category I. As such, they required material traceability. But, according to CB&I quality assurance procedures, material traceability was not required for what they categorized as Class D material and thus was not maintained. As stated in the assessment of Allegation A-258, the traceability of the Class D structural steel was satisfactorily resolved by Nonconformance Report (NCR) W3-6224. Even so, this NCR did not address the traceability of the weld material.

To assess this issue, the NRC staff reviewed the structures in which the "Class D" material was used and requested LP&L to provide the quality assurance (QA) documentation for welds in several of the structural components considered to have the greatest safety significance. These components were the containment spray system pipe supports (seismic clips), crane girders, and equipment hatch handling device. The staff also requested QA documentation for such items as welding procedures, welder identification and qualifications, weld rod identification, and the inspection results for certain welds in these components. This QA information is required for welds in safety-related structures. LP&L was unable to produce the records requested by the NRC staff. The inability to produce the appropriate QA records makes the quality of these safety-related structures indeterminable and the NRC staff has concluded that LP&L must take additional actions, as described below, to resolve this issue.

Actions Required: See Item No. 15 in the enclosure to the letter from D. Eisenhut (NRC) to J. M. Cain (LP&L), June 13, 1984.

Task: Allegation A-260

Characterization: It is alleged that there is a lack of traceability of certain materials used in non-pressure retaining components in the containment vessel such as equipment door handling device, personnel and escape lock hardware, and miscellaneous structures. This allegation is related to Allegation A-258.

Assessment of Allegation: The alleger suggested that in order to resolve the issue of lack of traceability, samples of the materials in question should be taken and mechanical and chemical analyses performed to determine if the materials were acceptable.

The alleger's suggestion is a plausible solution to the issue of traceability of materials. However, the NRC staff determined as a result of its inspections that this concern was satisfactorily resolved with regard to the base metal as described in the NRC staff's assessment of Allegation A-258. However, the issue of traceability of the weld material, process and personnel used in welding the Class D materials inside the containment has not been satisfactorily resolved. The allegers suggestion has been identified as an option in resolving the issue in Allegation A-259.

This allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-263

Characterization: It is alleged that a Mercury Construction Superintendent did not agree with Mercury audit findings and refused to correct problems identified.

Assessment of Allegation: The allegation arose from an audit finding in Mercury Internal Audit No. 12-1-82 (December 12, 1982), which documented that tubing did not have end caps. It was alleged that the Construction Superintendent refused to take corrective action.

The NRC staff reviewed the Mercury audit files and noted that the audit recommendation block had the Construction Superintendent's comment, "Do not agree with your recommendation." The Mercury auditor had also referenced Corrective Action Report (CAR) 124-125, closed out February 27, 1983.

The NRC staff learned that a Mercury Construction Supervisor assigned to the area where end caps were found missing had immediately taken corrective action. His superintendent received the audit finding and noted an additional recommendation made by the Mercury auditor, that supervisors and lead personnel do not adequately instruct and train subordinates in correct interpretation of Mercury procedures and that a lack of enforcement exists. The superintendent disagreed with this additional recommendation, not with the missing end cap problem for which corrective action had already been taken.

The NRC staff determined that the Mercury auditor's finding did not contain sufficient objective indications to support the auditor's additional recommendation; even though the auditor thought the situation to be true, he did not document his finding. The CAR which the auditor referenced, and which he had included in the audit report, stated that disciplinary action was not appropriately applied or given to personnel. The auditor expected disciplinary action to be taken against certain Mercury construction craft personnel. The NRC staff agreed with the Construction Superintendent's conclusion that this type of recommendation was not appropriate to include in an audit report. However, the review of the Mercury audit program identified other problems as described in the NRC staff's assessment of Allegation A-48.

This specific allegation regarding the Construction Superintendent's refusal to take corrective action has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-264-1

Characterization: The alleger stated that accurate material traceability on instrument tube track could not be provided.

Assessment of Allegation: During his testimony, the alleger provided copies of ten warehouse requisitions pertaining to 4"x4"x1/4" tube steel and 4"x3"x1/4" angle steel. These requisitions had been given to him by an unnamed document control clerk in response to his question regarding traceability of instrument tube track material. Because these requisitions referenced heat numbers for the material issued, and because the tube track material installed did not contain heat number identification, his concern was that required traceability was not maintained.

A review of the purchase orders referenced on the ten warehouse requisitions indicated that this material was structural steel (specified to be ASTM A-36). A review of purchase orders for tube track material, indicated the tube track material was 2"x2".098" angle or 2"x2"x2"x.098" channel (specified to be ASTM A-569 or A-570). Therefore, it was concluded that the material referenced on the ten warehouse requisitions was not tube track material and could not have been inadvertently used as such.

ASTM specifications A-569 and A-570 both refer to ASTM A-568, Section 2 for "General Requirements for Delivery." The provisions of this section do not require a unique heat number identification stenciled or stamped on the steel for this type of material. In addition, a detailed review of Contract W3-NY-15, "Installation of Pneumatic and Electronic Instrumentation and Performance of Related Work," Rev. 1, dated April 4, 1978, and Instruction IC-1, "Instruction for Erection of Instrumentation Systems," Rev. 1, dated April 1, 1978, did not require unique heat number traceability for tube track material to the point of installation. The NRC staff discussed its findings with the alleger who agreed that the requisitions he gave the staff were not for tube track material.

The NRC staff concludes that this allegation has neither safety significance nor generic implications.

Actions Required: None

Task: Allegation A-264-2

Characterization: The alleger stated that he was not sure whether field verifications were performed to assure compliance with revised criteria relating to instrument tubing physically in contact with tube tracks.

Assessment of Allegation: The alleger provided a memorandum (number ES-6515-82, dated October 28, 1982), showing revised criteria for installation of instrument sensing lines. In a conversation with the alleger, he stated that his concern was not with the adequacy of the disposition of NCR #W3-3573, but that he was "not sure" whether conformance to these revised criteria was ever field verified.

The referenced memorandum instructed that Mercury QC Procedure QCP-3110.4 be modified to include the revised criteria and that NCR W3-3573 be revised to incorporate memorandum ES-6515-82 into the NCR disposition. A review of these documents found that the required revision and incorporations had been performed.

A field walkdown of instrument line FT-SI-0390BS (as specifically mentioned in NCR W3-3573) and approximately 1000 additional feet of installed instrument tubing was performed. This additional 1000 feet of instrument tubing was inspected during the recently completed Construction Assessment Team (CAT) inspection of Waterford, Unit 3. This inspection revealed no instances of tubing touching the tube track. It appeared that field inspections did include these revised requirements, since the revised criteria were properly incorporated into the inspection procedure, and no nonconforming conditions were observed in completed installations.

The NRC staff concludes that this allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-265

Characterization: This allegation details a concern that data entries made on instrument tubing support documentation have been altered to reflect the as-built condition in the field.

Assessment of Allegation: Ten Mercury nonconformance reports (NCRs), as supplied by the alleger, were reviewed. Each of the NCRs details discrepancies between the documented heat numbers of instrument tubing supports and the actual support member heat numbers installed in the field.

The disposition of these reports resulted in the inspection documentation being changed to reflect the as-built condition of the support. A review of the hanger/support inspection records, Form 262, confirmed that this had been accomplished. Field examination of the support members verified that heat numbers were as-identified on the inspection records as changed. It was determined that this method of documenting and correcting hardware/document discrepancies was in accordance with program requirements.

The applicant's walkdown of Instrument Support Systems revealed installations in which certain attributes did not match those indicated on inspection records. To document this deficiency, nonconformance reports were initiated, identifying specific hardware/documentation discrepancies. For the nonconformances examined, these discrepancies consisted of heat numbers, stamped on the material which did not match the heat numbers shown on the original inspection document. In determining appropriate corrective action, all of the applicable material heat numbers were verified to assure proper material certification and traceability. No problems were identified during this check.

The staff could not determine why the original inspection data did not agree with the field installation; however, it was observed that all of the supports identified on the NCRs reviewed had been inspected on approximately the same date, it is therefore considered possible that these discrepancies were a result of an inspector error in transposing data from field notes to the actual inspection report. No indication was found which would indicate that the actual support had been moved or relocated.

The Mercury nonconformance reports reviewed do detail a requirement to change quality assurance records to reflect the as-built condition of instrument tubing supports. However, these changes appear to have been made to assure accuracy of quality assurance documentation which previously contained erroneous data.

This allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-267

Characterization: It is alleged that some Mercury nonsafety-related pipe hangers were placed in safety-related areas and that the resulting documentation was falsified.

Assessment of Allegation: The NRC staff assessed this allegation by reviewing several pipe hangers at random. The identification number obtained from each hanger provided a means to determine if the hanger was correctly located. Location was verified by comparing the identification number obtained during the inspection with the corresponding number shown for that hanger on the as-built drawing.

The NRC Instrumentation & Control (I&C) team reviewing Allegation A-265 recently conducted a similar walkdown, but with a different objective, to obtain the identifying numbers from 10 different pipe hangers now in place. They verified that when checked against the as-built drawing and record packages, the hangers were properly located. Although the I&C team found that certain as-built drawings required minor modifications, no discrepancies were uncovered during their documentation and material traceability review.

This issue has neither safety significance nor generic implications.

Action Required: None.

Task: Allegation A-268

Characterization: It is alleged that surface-mounted base plates for instrument stands and tubing supports have not had grout placed beneath them by contractors to provide an adequate contact surface.

Assessment of Allegation: In assessing this allegation, the NRC staff reviewed the pertinent documents and discussed the issue with the alleger. The staff determined that EBASCO had addressed this issue in a design change notice (DCN) on November 15, 1982. This DCN resulted in deletion of the requirement that 1½ inches of grout be placed beneath any plate smaller than the P101 plate (that is, smaller than 11½" X 11½"), unless no support area was available. A second DCN, issued on January 27, 1983, specifically exempted the B-430-type supports and base plates from being subject to the requirements which had been specified on the necessary contact or bearing area because these supports were smaller than the P101 plate.

The alleger, in subsequent conversations with the NRC staff, disagreed with the concept of allowing zero or nearly zero contact area for these base plates which were allowed by these DCNs. The basis for the DCNs was an EBASCO interoffice memorandum of October 18, 1982, which utilized engineering judgment to allow the omission of any base plate criterion for the B-430-type support because of the small loads involved.

The NRC staff decided to apply an objective standard to test this criterion for the lightly loaded base plates rather than rely solely on Ebasco engineering judgment. Accordingly, the staff reviewed details of various B-430-type support and selected two 10" X 10" plates for sampling because they were nearly the largest permitted under the criterion as not requiring any specific bearing area. One sample allowed a maximum load of 50 lbs for the instrument it supported and the other allowed a maximum of 150 lbs of dead load for the tubing it supported. Based on a simplified calculation, the NRC staff determined that if a triangular load distribution were assumed over about one-half of the plate to resist the compression force, the maximum stress under the worst-case load (a safe shutdown earthquake) would be approximately 10 psi for the first sample and approximately 200 psi for the second.

Based on these extremely low values of bearing stress needed to resist the applied load, the NRC staff concluded that while on the face of the statement from the EBASCO memorandum (October 18, 1982) "that any bearing surface attained would be acceptable for the small loads involved," meaning a zero bearing surface could be permitted, the practical realities were that a 10" X 10" bearing plate which was anchor bolted to a concrete surface will be able to develop an equivalent bearing stress of only 200 psi. This would be true even if that surface had rather gross irregularities (like ½" over the 10"). Therefore, the staff concluded that this item had neither safety significance nor generic implications.

Additionally, the NRC staff reviewed EBASCO nonconformance report (NCR) W3-6726 that addressed an EBASCO walkdown of piping hangers. EBASCO found that 7 of 200 did not meet the project criterion that there be a 4" X 4" bearing surface around each expansion anchor. Based on this information, an inspection was performed by EBASCO on an additional 410 base plates using a 1/32" gap gauge to

check for bearing contact. The results necessitated additional analysis for five plates. The analysis resulted in the determination that the plates were acceptable in the as-built condition. Based on this action, the NRC staff concluded that LP&L had also adequately addressed a similar concern that could arise on the more heavily loaded base plates.

Actions Required: None.

Task: Allegation A-270

Characterization: It is alleged that the concerns mentioned in a document called an "after-action report" written by an EBASCO quality control (QC) civil engineer (dated December 15, 1975) on the common foundation basemat, Block No. 2 (placement sequence 3), had never been properly addressed or resolved.

Assessment of Allegation: Based on a QC civil engineer's observation of the placement of Block No. 2, he recorded a number of concerns regarding construction practices, including: (1) construction placement procedure; (2) use of vibrators; and (3) the manner of concrete deposit. The document also noted that the efforts by the EBASCO placement inspector, the QC civil engineer, and the contractor's quality assurance (QA) personnel to alleviate the above conditions were ineffective. The above document did not indicate that the placement was unacceptable; in fact, the recommendations included in the document were directed toward future placement. Further, the "after-action report" was not a recognized QA document, according to the project procedures and, as such, did not require formal disposition. Based on conversations with LP&L and EBASCO personnel and the review of 20 of 28 basemat concrete placement packages, the NRC staff found this to be the only instance of the use of so-called "after-action report."

Block placements 6, 1, and 2 (the first three) were placed prior to the date of this "after-action report." Two site surveillance reports dated December 2, 1975 (Block No. 6) and December 11, 1975 (Block No. 2), and an EBASCO audit report dated December 2, 1975, contained observations similar to those noted in the document from the EBASCO quality control civil engineer. Based on these reports, LP&L issued Stop Work Order No. 1 on December 16, 1975. Prior to the Stop Work Order, LP&L personnel met with EBASCO and the concrete contractor, J. A. Jones, on December 5, 1975. Based on the NRC staff review, it appears that all the EBASCO quality control civil engineer concerns have been addressed, including the implementation of the recommendations, during the resolution of this Stop Work Order.

It was found that for the placement of Blocks 10B and 19 (after the Stop Work Order), which had significant placement problems due to external causes, the drilled core data did not exhibit any reduction in the concrete strength. In the first instance, heavy rainfall during a placement created concrete washout near the edge forms and, in the second instance, errors in the concrete placement sequence and configuration caused concern about cold joints which were investigated and repaired. Further, all the surface deficiencies for the first three placements were repaired and disposed of by deficiency notices (DNs). The impact on the structural integrity of the basemat as a result of some of the placement practices observed by the QC civil engineer (e.g., excessive lift and inadequate vibration) was discussed in conjunction with Allegation A-139, and has been reviewed by an NRC consultant, who independently evaluated the impact of construction deficiencies on the basemat. The consultant found, and the staff agrees, that the structural integrity of the first three placements was not degraded.

The NRC staff concludes that the concerns in the "after-action report" have been addressed by resolution of audit and surveillance reports, and have neither safety significance nor generic implications.

The NRC staff discussed these findings with the alleger. The alleger did not want to discuss the specifics of the document, but was satisfied that the NRC had adequately reviewed the item and assessed the impact on the quality of the basemat.

Actions Required: None.

Task: Allegation A-271

Characterization: It is alleged that improper consideration was given to upgrading the process for cleaning and coating the interior of the containment vessel.

Assessment of Allegation: In assessing this allegation, the NRC staff examined the memorandum related to this allegation written prior to application of coatings to the containment vessel by Chicago Bridge and Iron (CB&I) and prior to post-weld heat treatment (PWHT). This memorandum summarizes the investigations, studies, and discussions on the subject of containment vessel cleaning and coating. This letter, between EBASCO's New York and site offices, listed three options that could be used to upgrade the cleaning and coating system for Waterford Unit 3 containment vessel prior to PWHT. EBASCO abandoned the three options because each would cause a contract price increase and delays in the construction schedule.

EBASCO's conclusion was basically to make no changes in the coating system, no revision to the specification, no increase in the contract price, and no extension to the construction schedule. EBASCO stated that they hoped any shop primer failure after PWHT would be localized and easily repaired.

A review by the NRC staff of the CB&I cleaning and coating system for the Waterford Unit 3 containment vessel, indicated that if CB&I had implemented a good QA program to monitor coating application, the resulting problems discussed in Allegation A-256 could have been avoided.

When this memorandum was generated, the issue had safety significance at the time the decision was made not to upgrade the coating work, but subsequent action discussed in A-256 resolved the safety issue.

Actions Required: None (refer to A-256).

Task: Allegation A-273

Characterization: It is alleged that there was incomplete quality control (QC) field verification of corrective action prior to closure of EBASCO Nonconformance Report (NCR) W3-2333, which was written to document certain support types which had not been reviewed for seismic qualification.

Assessment of Allegation: The alleger supplied to the NRC staff a conversation record between himself and a former Mercury employee. From this document, the staff learned that the employee had told the alleger that, as of the time he left Mercury and the Waterford 3 site, only about 95 percent of the required QC field verifications pertaining to NCR W3-2333 had been accomplished. In view of this information, the alleger's concern was whether the other 5 percent of the field verifications had been performed prior to closure of the NCR.

The NRC staff contacted the former Mercury employee in order to determine which hanger supports had not been reviewed. He stated that all but eight of the supports requiring rework had been completed, inspected, and documented.

The NRC staff reviewed EBASCO NCR W3-2333 and found these eight supports documented in the closed NCR package. The staff reviewed the documentation and the remainder of NCR W3-2333 for adequate closure. The staff found that the NCR adequately addressed field verification of hanger supports and had been dispositioned and closed out properly.

This allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-276

Characterization: The allegation is that in one case the QA Manager for Mercury Construction Company directed the Mercury Training Officer to change the resume of one inspector to reflect more experience than the individual actually had.

Assessment of Allegation: The implied significance of this allegation is that if the inspector in question was incorrectly certified to a higher level of performance than his previous experience would allow under ANSI N45.2.6 and the Mercury procedure for qualification of QC inspectors, inspections performed by this inspector on safety-related systems could render the quality of those systems as indeterminent.

The NRC staff, working in conjunction with the NRC Office of Investigation (OI), has determined that the resume of the inspector in question was falsified and that he performed safety-related inspections while incorrectly certified.

This allegation has safety significance and is indicative of a generic problem for inspector certification.

Actions Required: See Item No. 1 in the Enclosure to the D. Eisenhut letter of June 13, 1984 to J. M. Cain (LP&L).

Task: Allegations A-279, A-280, A-282, A-284, A-288, A-27

Characterization: The allegation is that inadequate documentation reviews were performed by Tompkins-Beckwith (T-B), EBASCO, and Mercury in that open deficiencies were found in packages which had been reviewed and accepted.

Assessment of Allegation: The implied significance of this allegation is that inadequate review of quality documentation could cause installation to be questionable and inspection results to be invalid because of a lack of assurance of technical content and completeness.

The NRC staff reviewed the turnover packages (system QA documents) for T-B, EBASCO Construction (Force Account), and Mercury. The staff also reviewed the following procedures: Mercury Co., QPC 3010; T-B, TBP-20 and TBP-35; and EBASCO, QAI No. 1, QAI No. 9, QAI No. 9A.

Mercury, T-B, and EBASCO Quality Assurance Installation Review Group (QAIRG) had reviewed 100% of the QA documents.

Tompkins-Beckwith (T-B)

In its QA documentation review, T-B found the turnover packages to be acceptable. A subsequent review by EBASCO QAIRG revealed problems such as incomplete/incorrect documentation. T-B took actions and corrected the deficiencies, as confirmed by a later EBASCO QAIRG review. The NRC staff reviewed selected documentation for technical adequacy, completeness, and indications of proper contractor and EBASCO review and concluded that QA documentation was adequate.

Mercury Company

A review was conducted by the NRC staff that included six Mercury Operational Control Records (OCR). No open Nonconformance Reports (NCRs) were found in the Mercury documentation reviewed. OCR Package 1782, drawing 172-L-012-C, Revision 4, had a handwritten note on it identifying two lines, DPT-RC-9116 SMB (HP) and DPT-RC-9116 SMA (HP), where the separation criteria had been violated. Subsequent to the problem identification by the NRC, LP&L initiated an Engineering Discrepancy Notice (EDN) to document this problem and subsequently generated an NCR (W3-7702). This problem was not identified during the review and closeout of the Mercury OCR packages and as such was an open item. In addition to the NCR, LP&L was looking at all OCRs in Startup System (SUS) 52A for any other separation criteria violations. The NCR analysis showed that the expansion loops, which were the cause of the violation, can be removed (reworked) thus eliminating this problem. The safety significance and generic implications will depend on the outcome of LP&L's review of the rest of SUS-52A.

In OCR package 1020 for line DPT-RC-120/121 (LP), duplicate weld record sheets were found for field welds FW-1, 1C, 1D, 51 and 52. One weld record showed these welds as deleted and the other sheet showed them as being acceptable. A walkdown of the system revealed that these welds are not a part of the installation and that the drawing accurately reflects what is installed. LP&L has initiated the required actions to remove the inaccurate record from the OCR package. The NRC staff considered this is an isolated occurrence and found no safety significance or generic implications.

EBASCO Construction (Force Account)

The NRC staff review of EBASCO Force Account quality documentation turnover packages disclosed that they were, in general, adequately reviewed. The exception was work accomplished as a result of the disposition of nonconformance reports (NCRs). NCR work packages were closed out and submitted to the vault without an independent review by EBASCO QA or QAIRG. Upon detection of this problem by the NRC staff, EBASCO instituted the following corrective action: (1) the applicable procedures were revised to assure independent review by EC-QA and QAIRG; (2) affected QA/QC personnel were instructed, in formalized training classes, of the procedural changes; and (3) the number of affected packages (twelve) were identified and submitted to EC-QA and QAIRG for review. The NRC staff re-reviewed five of the twelve work packages and found them to be acceptable.

Based upon the above reviews, the NRC staff found that EBASCO had an adequate system for identifying and resolving deficient items in work packages. EBASCO also informed LP&L System Startup about system status via a cover letter noting exceptions as "System Turn-Over Exceptions."

Indoctrination and training of personnel performing document reviews was reviewed by the staff and is documented in Allegations A-109 and A-294. See also Allegations A-143, A-150, A-162, A-163, A-188, A-190, A-191 and A-193 for more details in this area.

In conclusion, the reviews of contractor and EBASCO QA documentation by the NRC staff revealed the procedural controls and actual documentation to be technically adequate and complete, and that documentation deficiencies were identified and corrected in most cases prior to system turnover. The items with corrective action remaining open were identified as system turnover exceptions. The issue on the instrumentation separation criteria violation was significant and may have generic implications; the other issues have neither safety significance nor generic implications.

Actions Required: (See Item 3 in the Enclosure to the D. Eisenhut letter to J. M. Cain, June 13, 1984.)

Task: Allegations A-283; A-181

Characterization: The allegation is that the process for initiating NCRs was discouraging.

Assessment of Allegation: The implied significance of this allegation is that the lack of processing due to the impediments in the NCR process may have prevented adequate identification and timely corrective action on non-conformances and that consequently the installations may be questionable.

The NRC staff reviewed this allegation in conjunction with Allegations A-49 and A-123 using the following methodology: 1) Evaluated EBASCO procedures which were used to control nonconformances; and 2) Evaluated related correspondence and LP&L responses to that correspondence.

EBASCO Procedures

The NRC staff reviewed the EBASCO procedures that address NCRs and found that both the 1978 and subsequent 1984 revisions provided complex instructions for the initiation and processing of nonconformances and discrepancies. These instructions, by the nature of their complexity, may discourage some individuals from going through the process of initiating nonconformances or discrepancies. The procedure although complex was found by the NRC staff to be an acceptable one.

Related Correspondence

Selected correspondence on this subject was reviewed but conclusive substantiation of this allegation could not be made.

Based on this assessment and other reviews on this subject, the NRC staff concludes that this allegation has neither safety significance nor generic implications.

However, it should be noted that the NRC did identify several problems with the NCR system and its implementation (see Allegations A-18, A-33, A-302, and A-232). Additionally, LP&L initiated an exit interview process to identify employee concerns in January 1984. Although this system was identified by the NRC Task Force to have some deficiencies (Eisenhut letter to Cain, dated June 13, 1984) the system, when properly implemented, should help resolve this type of an employee concern.

Actions Required: None.

Task: Allegation A-286; A-289a

Characterization: The allegation is that Tompkins-Beckwith (T-B) Records Reviewers falsified heat numbers to demonstrate adequate traceability. Examples of affected startup systems (SUS) included SUS-36, Component Cooling Water and SUS-60, Safety Injection.

Assessment of Allegation: The implied significance of this allegation is that heat numbers may have been falsified and that the quality assurance (QA) documentation may not reflect the actual hardware in the plant, placing the quality of installation in question.

The NRC staff reviewed this allegation by evaluating T-B document system procedures and comparing them to the ASME Code and applicable ANSI N45.2 requirements. The NRC staff found T-B's procedures to be adequate (also see Allegations A-35, A-172, and A-308).

The NRC staff reviewed a sample of T-B turnover packages and found them to be adequate. This review is discussed in detail in Allegation A-308. Included in this sample were work packages from SUS-36 and SUS-60. No obvious falsification of heat number entries was observed (see Allegations A-35 and A-308).

Heat numbers were selected from the T-B work packages by the NRC staff, and documentation was presented to the satisfaction of the staff that the heat numbers were valid, including back-up material test reports and heat number identification marking on the installed items (see Allegations A-100 and A-172). The staff's review of T-B turnover packages could not substantiate the allegation.

The NRC staff interviewed six EBASCO document reviewers who were onsite at the time of the allegation. They all stated they had no problem obtaining access to contractor records. The EBASCO Site Supervisor of the Quality Control (QC) Verification Group stated that "when requested by the EBASCO Document Reviewers, a questionable or missing heat number would be verified by the QC inspector, who would physically check material for heat number marking" (see Allegations A-97 and A-172). The QC Verification Group was available to any reviewer concerned with falsification of records or any problem with heat numbers. Issues could have been resolved during the review of the packages.

Two specific individuals were alleged to have made heat number changes: one was the T-B Project Engineer, and the other was a T-B QA Coordinator. The NRC staff did not find any indications that the Project Engineer made any changes to QA records. The QA coordinator was authorized to change QA records. T-B Inspector certifications are discussed in Allegations A-28, A-304, and A-285b. The T-B system provided for document changes by authorized personnel. The NRC staff found no indications that any unauthorized changes were made.

The NRC staff found no indications of falsified heat numbers. This allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-289(b)

Characterization: The allegation is that quality assurance (QA) documentation of System 60 (safety injection) did not have an adequate review because the EBASCO reviewers were not qualified.

Assessment of Allegation: The implied significance of this allegation is that the review of records for System 60 may have been ineffective because it was conducted by unqualified personnel, and the quality of the installation of this system may be indeterminate.

The NRC addressed this allegation by reviewing EBASCO record requirements, record reviewer qualifications, and a sample of records from System 60. The NRC staff found that EBASCO procedures require records reviewers to have a high school education, classroom training, on-the-job training, and to have completed assigned reading lists.

The NRC staff selected a sample of turnover work packages from System 60, and reviewed the qualifications of records reviewers who reviewed and approved these packages. Although formal training of records reviewers was not complete at the time of System 60 turnover, this system was reviewed by QA personnel (inspectors) that were qualified to review records. Records reviewer qualifications are also discussed in Allegations A-06, A-92, and A-294. Work performed by records reviewers is discussed in Allegation A-35.

A problem concerning incomplete training records for records reviewers was addressed by EBASCO during an audit in October 1983. Subsequent action updated and completed those records or addressed open items, and the audit was closed in January 1984. The NRC staff reviewed the audit and concurs with the disposition, action, and closure.

The EBASCO training program was considered adequate by the NRC staff. There are no specific training, qualification, or certification requirements for document reviewers in NRC regulations, the ASME Code, or ANSI standards.

The NRC staff found no indications of records reviews by unqualified personnel. The EBASCO system of records reviewer qualification was adequate and problems encountered in formal training were properly addressed. This allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegations A-290 and A-301

Characterization: The allegation is that the disposition of corrective action documents was not adequate to correct the deficiency and changes were incorrectly made to QA records.

Assessment of Allegation: The implied significance of this allegation is that if it is true, identified deficiencies could still be uncorrected, making the installation and inspection of safety-related systems questionable.

In assessing this allegation, the NRC staff (1) reviewed EBASCO and Tompkins-Beckwith (T-B) procedures for corrective actions; (2) sampled T-B QA documents that had deficiencies corrected by either an NCR or by a speed letter, and (3) evaluated selected NCRs, DRs, and DNs for the proper disposition and corrective action.

The NRC staff also compared T-B and EBASCO procedures for corrective actions and for processing nonconformances (NCRs), DNs, and DRs, with the applicable requirements of the ASME code, ANSI 45.2, and 10 CFR Part 50, and found them to be acceptable. The use of speed letters and memos was not addressed in these procedures and the NRC staff concluded, after several interviews, that speed letters and memos were only used to provide information or to request information between EBASCO and its subcontractors.

The NRC staff assessed the following specific allegations.

Allegation A-290 alleged that after a Deficiency Report was transmitted to Tompkins-Beckwith, it was questionable as to how corrective actions, including walk downs, were accomplished. (The NRC staff reviewed this allegation concurrently with Allegation A-33.) The staff determined that Quality Assurance Instruction (QAI) 9 provided adequate instructions for forwarding the deficiencies discovered during records review to the responsible organization for resolution. It also included actions to be taken by the reviewer should a deficient item require resolution through the implementation of an NCR or DN. However, the staff found that the procedures lacked instructions for followup action or resolution of these deficiencies to assure proper closure. Additionally, the NRC staff found that T-B's procedures did not address how these types of deficiencies would be resolved or closed.

Allegation A-301 alleged that about 40% of the changes made to records were not done correctly for both programmatic and hardware deficiencies. Most of these deficiencies were identified at least on a speed letter or on an EBASCO Deficiency Report. In many cases, the change made was not adequate to correct the deficiency. (See Allegation A-05 for examples of questionable disposition and inadequate or incomplete closure.) Based on a sample review of the packages and deficiency reports relating to the package, the NRC staff believes that there are still open deficiency reports.

The NRC staff also reviewed T-B DNs in Allegation A-302.

Actions Required: See Item 6 in the Enclosure to the D. Eisenhut letter of June 13, 1984 to J. M. Cain (LP&L).

Task: Allegation A-294

Characterization: The allegation is that the personnel used by EBASCO to perform documentation reviews were not qualified to adequately perform record reviews in the short period they were given.

Assessment of Allegation: The implied safety significance is that if the EBASCO record reviewers were not qualified to perform the record reviews in the short period they were given, the quality of records review for the applicable safety-related systems may be indeterminate.

The NRC staff determined that the EBASCO procedure for review of records required record reviewers to have previous experience in quality documentation and to complete on-the-job training (OJT). The alleger gave a specific person to contact and the specific time period for this allegation was April to July of 1983.

Following a discussion with the person specified, the NRC staff selected resumes of 24 records reviewers who had completed OJT in the time span specified. A review of their resumes indicated that all had previous experience in quality assurance, engineering, or design. The staff also reviewed EBASCO indoctrination and training records for the reviewers and found that all had completed the required training and OJT required by EBASCO procedures. Previous reviews of allegations regarding documentation have not indicated any problems caused by unqualified record reviewers (See Allegation A-35).

There are no specific training, qualification, or certification requirements in NRC Regulations, the ASME Code, or ANSI Standards for document reviewers.

Regarding the adequacy of reviews "in a short period" of time, the NRC's review of QA documentation revealed these documents had been reviewed adequately and were acceptable. Also see Allegations A-35, A-183(a), A-197, A-223, and A-230.

The NRC staff finds no indications supporting the allegation of inadequate documentation reviews by unqualified personnel, and believes the EBASCO training program was adequate. This allegation has no safety significance or generic implications and is not indicative of any management problems.

Actions Required: None.

Task: Allegations A-296, A-306a, 306k, 306l, 306m

Characterization: It is alleged that Tompkins-Beckwith (T-B) may have violated the ASME Code requirements by failing to visually examine the shop pipe welds for leaks during hydrostatic tests.

Assessment of Allegation: ASME Code Section III requires that, at the completion of Class 1, 2, or 3 piping system or subsystem installation, a hydrostatic test be performed, during which a visual examination for leakage is made of all welds.

The allegation challenges the correctness of the T-B records on visual examination of pipe welds during hydrotesting. The alleger believes that all welds (shop and field) should be identified by name on the weld checkoff list and that it is particularly important to identify shop welds since they were not subjected to a hydrostatic test in the vendor's shop. The alleger claims that it is unlikely that shop welds were examined during hydrotesting, since they were not specifically mentioned on the test instruction sheet and do not appear on the weld checkoff list.

After completion of the Class 1 and 2 hydrostatic weld inspection, according to T-B's Hydrostatic Test Procedure TBP-36, the information from the Hydrostatic Test Data Sheet and the weld check-off list was combined with data from other sources and ASME Form N5, Certification of Inspection, was completed. The authorized nuclear inspector (ANI) signed the reverse side of Form N5 to verify that the piping was installed in accordance with the ASME Code.

The ASME Code and T-B Procedure TBP-36 specify only that a visual examination during hydrotesting for leakage is to be performed without reference to where the pipe weld was made. The Test Information Sheet, however, states that the inspection is to verify that there will be no leakage from any permanent field welds. The welds identified on the checkoff list are all field welds. Although the words "field welds" were included in the hydrostatic test instructions, an inspector conducting a visual review of all field welds for leakage would most likely be aware of any shop welds that might be leaking. In addition, during the 10-minute minimum test period, plus the time required for visual examination, any drop in test pressure resulting from leakage would be noticeable and would indicate a condition requiring investigation.

The ASME Code does not require that all weld (shop or field) visual inspections be documented individually. A lack of documentation identifying each shop weld examined during field hydrotests does not violate the ASME Code. The basis for T-B system acceptance is the ANI's signature on Form N5, Certification of Inspection.

In assessing this allegation, the NRC staff reviewed the actual results obtained during the hydrostatic test. Although the wording on the test instruction sheet did not accurately reflect the intent of T-B Procedure TBP-36, the hydrostatic test was conducted in full accordance with the requirements of the procedure and the ASME Code.

The NRC staff discussed its findings with the alleger, who expressed general satisfaction with the resolution, but who feels that verification should be obtained to confirm that the shop welds were indeed inspected for leakage during the hydrostatic tests.

Actions Required: See Item No. 8 of the enclosure to the letter from D. Eisenhut to J. M. Cain (LP&L) dated June 13, 1984.

Task: Allegation A-298

Characterization: It is alleged that the EBASCO vendor reviews are inadequate and that quality control (QC) was not checking structural items for defects such as shop welds by Peden Steel.

Assessment of Allegation: A review of this allegation by the NRC staff in the civil-structural discipline concerning Peden Steel indicated that vendor reviews were performed at the vendor's facility by a vendor quality assurance representative (VQAR) who was employed by EBASCO. A review of records by the NRC staff confirmed that the VQAR performed inspections of safety-related structural items fabricated by Peden. These records date from June 1976 to November 1983. Vendor reviews in other disciplines are addressed in Allegation A-165.

The EBASCO QC organization for receiving and inspecting vendor-fabricated structural items did review and inspect such items as received at the site. In addition, the EBASCO records review group reviewed all vendor documentation in accordance with QAI-1, Revision 11, "Quality Assurance Records Management Instruction," dated July 12, 1983.

Review of a nonconformance report NCR W3-4776 by the NRC staff indicated that EBASCO QC rejected a shipment of reactor auxiliary building (RAB) restraint steel, by Peden steel, upon arrival at the site. The steel was rejected because the shop welds on the whip restraints did not conform to the design drawings and the requirements in American Welding Society, AWS D1.1. The welds were undersize and indicated undercut and a lack of fusion. This illustrated that a QC program was in effect onsite and offsite. In this particular case, the onsite reinspection of Peden Steel was a part of the overall quality program and performed its function by identifying problems not previously found by the offsite VQAR.

The NRC Construction Appraisal Team (CAT) inspection findings also indicated weld deficiencies in Peden Steel shop welds. This finding led to the preparation of NCR W3-5805. Attachments 7 through 10 of the NRC CAT inspection report listed welded connections that were evaluated by EBASCO Site Support Engineering (ESSE). A total of 720 welds were examined; of these, 28 had aspects not in accordance with the specifications and needed to be reevaluated. They were evaluated by ESSE and none required reworking.

From the results of the staff evaluation, it was determined that there were inadequacies in the vendor inspection effort. Some of these were identified by other QA levels and others similar to those found by the CAT inspection had not been previously identified. Based on the specific issue in the civil-structural discipline, it appeared all safety concerns were resolved. The generic implications are addressed in Item 5 in the enclosure to the D. Eisenhut letter of June 13, 1984, to J. M. Cain (LP&L).

Actions Required: None.

Task: Allegations A-302; A-307; A-303b; A-306s; A-306x

Characterization: The allegation is that lower tier corrective action documents were not being upgraded to NCRs. Also, FCRs, DCNs, and EDNs were issued after-the-fact for nonconformances in lieu of NCRs.

Assessment of Allegation: The implied significance of this allegation is that without proper identification of nonconformances, the proper disposition, timely corrective action, determination of root causes and actions to prevent recurrences cannot be taken; that quality trending cannot be accomplished; and that the requirement of 10 CFR 50 for the reporting of Construction Deficiencies (50.55(e)), cannot occur without the identification provided in an NCR.

This allegation was addressed by an NRC staff review of selected Field Change Requests (FCRs), Design Change Notices (DCNs), and Engineering Deficiency Notices (EDNs). The methodology used in this evaluation included an evaluation of random FCRs, DCNs, and EDNs for the Reactor Coolant, Safety Injection, and Component Cooling Water Systems. Additionally, FCRs, DCNs, and EDNs were selected at random and evaluated from the various document issuance logs. The selected design change documents were then reviewed for content and for the basis of issuance; that is, for whether they were issued "before-the-fact," as a design change or "after-the-fact," as a nonconformance report. Finally, the staff conducted a system walkdown to verify proper identification and change control completion. The NRC staff also reviewed Tompkins-Beckwith Discrepancy Notices (DNs) for proper review and upgrading to EBASCO Nonconformance Reports (NCRs). This review was conducted by selecting DRs from the DR log and the QA records vault. The NRC staff also reviewed Request For Information (RFI) records and responses to those requests. (See Allegation A-187.) The following is a summary of the NRC review.

Field Change Requests (FCRs)

The NRC staff reviewed 63 FCRs and 21 revisions to those FCRs. Of the 63 FCRs reviewed, 35 should have been NCRs (55%). An additional four may have reflected conditions that warranted an NCR, for a total of 39 (61%). EBASCO procedure ASP-I-4, Design Control dated June 7, 1983, states in paragraph 6.1.4, "FCRs shall not be generated in place of nonconformance reports." The practice of issuing FCRs in lieu of NCRs not only occurred in the past but continued during the staff review, as in the following examples:

1. F-MP-1818 (May 25, 1984). Miscellaneous piping; incorrect weld rod was used; the weld was removed and replaced with correct material. Contractor - T-B.

2. F-AS-3698 (January 6, 1984). Reactor Coolant (RC) Pipe Seismic Support; bolts and embed documentation changed to reflect as-built. Contractor - NISCO.

3. F-AS-3648 (December 2, 1983). Miscellaneous pipe supports; changed drawings to reflect as-built embed plate size and weld size. Contractor not indicated.

4. F-AS-2338 (February 2, 1982). RC supports; unacceptable weld gap between beam and embed, because embed was cut too short; disposition was to change design; seismic review may be required. Contractor - NISCO.

5. F-MP-1434 (February 8, 1981). RC spool piece installed backwards in pipe chase; disposition was to leave as installed. Contractor not indicated.

6. F-AS-1631 (December 20, 1979), and Revision 1 (October 10, 1980). Reactor Coolant pipe support. "Despite many attempts at repair and rewelding, these welds continue to crack." Design changed. Contractor - NISCO.

7. F-E-3089 (June 21, 1983). Combustion Engineering (CE) supplied enclosures on Reactor Coolant Pumps speed sensor pulse amplifiers. The CE supplied enclosures were replaced with a different enclosure. The replacement was done without CE review or approval. Additionally, no environmental or seismic qualification review had been done prior to change.

   Subsequent review by CE identified the enclosures as acceptable, however the gaskets on the new enclosures had high chlorine content and were unacceptable. An FCR was generated to replace the gaskets with "qualified" gaskets. Contractor - NISCO.

8. F-MP-2138 (September 26, 1982). Replaced broken 1-inch valves (cracked seats) in the RC system. Contractor - T-B.

9. F-MP-2151 (October 1, 1982). Replaced a valve because it would not hold pressure for cold hydrostatic test in the RC system. Contractor T-B.

10. F-E-2288 (August 14, 1981). Five cables were pulled through wrong conduit. The corrective action was to change documentation; that is, to reflect cable routing as-built, in lieu of correct routing. Contractor - Fischbach & Moore.

Design Change Notices (DCNs)

The NRC staff reviewed 14 DCNs and 5 revisions to those DCNs; of the 14 DCNs reviewed, 4 should have been NCRs (29%). The misuse of DCN, although not as prevalent as the FCR misuse, is a serious problem due to the fact that the NCR system was circumvented and adequate corrective action was not taken. The DCN system allows the option for the QA review to be determined by Engineering, consequently most of the DCNs were not reviewed by QA. A proper review by QA could have turned DCNs into NCRs, as in the following examples:

1. DCN-703 (September 24, 1982), and Revision 1 (September 27, 1982). Called for replacing four 3/4-inch valves with 1-inch spare valves in the RC System because the 3/4-inch valves had cracked seats. Revision 1 identified an additional seven valves with the same problem. This clearly should have been reported under 10 CFR 50.55e, or 10 CFR 21. This issue appears to be related to FCR-MP-2138.

2. DCN-IC-478 (March 30, 1981). Unidentified or misidentified valves in the warehouse were retagged via this DCN. This should have been an NCR. Contractor - EBASCO.

3. DCN-ME-30 (January 6, 1983). "Replacement of unqualified solenoid valves with Class IE environmentally qualified valves..." The subject system was the RC System. The reason for change, to meet environmental qualification requirements..." (IEEE 323 is dated 1974; this is not a new requirement.)

   DCN-ME-30, Revision 1 (May 5, 1983). Stated "Revise solenoid model to document As-Built." The NRC could not determine if a properly qualified correct model solenoid was actually installed.

4. DCN-E-790 (February 8, 1982). Revised a cable routing list to reflect as-built conditions.

Engineering Discrepancy Notices (EDNs)

The NRC staff reviewed 76 EDNs for proper identification and control. An additional 35 were identified as being improperly "voided" and 1 was noted open with no action ever taken. Of the 76 reviewed, 51 should have been NCRs. Of the total 5 were turned into NCRs, the balance of 46 (60%) should have been NCRs. Additionally 3 EDNs were identified non-safety related that should have been safety related. The 46 EDNs, which should have been NCRs, plus the 14 safety-related EDNs of those incorrectly voided, yield a total of 66% which should have been NCRs, or which were improperly processed. The 35 EDNs "voided" were the result of actions by a clerk via a "speedy-memo" because these 35 EDNs could not be located; they were in effect lost or never processed. In accordance with section 6.3.2 of EBASCO procedure ASP-IV-70, Handling of Engineering Discrepancy Notices, "EDNs that are safety-related shall be forwarded to the Quality Assurance Supervisor for his concurrence...and upgrading to an NCR if required..." Since the site engineering group determined what EDNs were routed to QA for this review process, and many were not forwarded to QA, part of the system breakdown appears to have occurred in this area. Also there is no objective indications that the QA Supervisor reviewed all safety-related EDNs forwarded to him, which accounted for the remaining part of the breakdown. There is also no method in the procedure to void EDNs.

The following examples are indications of misuse of EDNs in lieu of NCRs:

1. EDN-EC-1476 (September 6, 1983). Stated "Weld No. W101 on Whip Restraint R-BD-2-R23, for System 19-16, that the MT or PT on the weld root pass was bypassed." The disposition was "use-as-is" based on acceptable UT.

2. EDN-E-1548 (November 19, 1983). Stated "Safety related cable was damaged." The disposition was to repair. The approval of the corrective action and reinspection was signed by the same individual. The signatures were later crossed-out and replaced with initials. The approval and reinspection are both indeterminate. Also the signatures were made by an engineer, not by a qualified inspector.

3. EDN-EC-1502 (October 5, 1983). Stated " Control room and control panel conduit was not installed per the drawing requirements." The disposition was to issue an FCR to change the drawings.

4. EDN-EC-1479 (September 8, 1983). Stated "A snubber was installed, RCSR-4167 (Reactor Coolant), as a seismic Category 1 and safety classification 1. The snubber was procurred on a purchase order as non-safety related (total number ordered on this purchase order was 4)." The disposition was "Install the snubber as received. QA records to review documentation to verify snubbers are acceptable as safety-related items. If documentation does not support safety related requirements, EBASCO Purchasing Department is to obtain documentation from the vendor." This EDN was later voided by a speed memo with no explanation provided. Documents attached to this EDN included Bergen Patterson C of C dated May 4, 1982, certifying hangers "7738-02 and 7838-03 Random Short Form" were manufactured in accordance with B31.1. Also attached was the Bergen Patterson Bill of Lading stating "Inspection Not Required, Standard Travel Stops, CMTR not Required, Project - Nuclear Plant." Status of these snubbers was indeterminate.

5. Thirty-Five (35) voided EDNs - The voiding was accomplished via a speed-memo; 14 of the voided EDNs were identified as safety related. The following chronology outlines this issue:

   - September 20, 1983 - The EBASCO Construction Administrative Engineer issued a memorandum distributed to 28 individuals stating that "the attached list identifies EDN numbers assigned to you for which we have not received the original EDN for distribution. This is an indication that EDNs have not been written or have been voided." He further states that unless his department received information regarding the EDNs by October 1, 1983, they would be voided.

   - October 27, 1983 - Later the Administrative Engineer issued an additional memorandum stating all EDNs with the exception of those on the page 2 of the attached list (containing 36 EDNs) had been clarified.

   - December 12, 1983 An engineering clerk, issued a speed-memo to QA Records (Supervisor) stating 35 EDNs were "voided." The clerk had previously received a memorandum from the Administrative Engineer "voiding" the EDNs.

The Administrative Engineer was interviewed by the NRC during the week of April 21, 1984, and he indicated that no one made any effort to review the EDNs for content or safety implication of required corrective action prior to voiding them. Examples of the voided EDNs were as follows:

1. EDN-EC-0630 (October 21, 1982). Stated "Inadequate drainage at -35' elevation floor in the RAB - Reactor Auxiliary Building."

2. EDN-EC-1175 and EDN-EC-1176 (March 18, 1983). Stated "Material on Hold" and "QC Volume AGW QC.1"; the specifics of these EDNs are unknown.

It should be noted that the EDN logbook indicated these EDNs were initiated by the EBASCO General Material Administrator who was interviewed and indicated that he had no knowledge of opening any EDNs. Both EDNs were marked safety related.

3. EDN-EC-1140 (March 2, 1983). Stated "Operators for valves 3FW-V-607A and 6CD-V343 are installed on the opposite valves." Although the EDN was closed, the actual installation was not verified or was incorrectly verified. The NRC inspection of these valves revealed the following:

   - Valve 6CD-V343 has the operator tagged and identified on the name plate as 3FW-V605B.

   - Valve 3FW-V607A has the operator tagged and identified on the name plate as 6CD-V348. An additional tag was also noted attached to the operator identifying it as 6CD-V348.

   Although the EDN only identifies problems with two valves, four valves were actually involved.

Tompkins-Beckwith (T-B) Discrepancy Notices (DNs)

The NRC staff reviewed procedure TBP-12, Nonconformances and Discrepancies, that states in section 6.2 "DNs are required to be upgraded to EBASCO NCRs when the following criteria applies..." (as defined in section 4.1).

Nonconformance - A deficiency in characteristic, documentation or procedure which renders the quality of an item or service unacceptable or indeterminate. Examples of a Nonconformance include: physical defects, test failures, incorrect or inadequate documentation; or deviation from prescribed inspection or test procedures, drawings, Code and Contract requirements.

The NRC review revealed that T-B failed to upgrade DNs as required. The following DNs are examples that fall into this category:

W-6519 The DN was written identifying that a torque required by the flange control record was outside the range of the torque wrench. The disposition stated that an adapter was used but this was not required. Also, it states "accept-as-is" because of the successful hydrostatic test. This does not answer the question of the torque values. The problem is that the bolts were over torqued. This DN should be upgraded to an NCR because of the incorrect documentation and because the quality of the flange is indeterminate. Service conditions were not reviewed for impact.

W-6183
W-6322
W-6519
These DNs were written against a torque wrench being used outside of its calibrated range. The disposition stated that the torque wrench was not required because the Code only requires all bolts to be tightened equally. This does not resolve the problem of the torque wrench use. The bolts used to make up the flange still have torque requirements and the question of under torquing has not been resolved. An NCR covering the torque value of all flanges that have been improperly torqued should have been issued.

W-3656 Identified a problem with the incorrect heat number being used for Weld FWII RWIR-1. The disposition of this DN appeared to be invalid because not all of the disposition required items were addressed; i.e., the attachments did not show corrected rod slip or the QC-accepted heat number change on the weld record.

W-5755 This DN identified a problem with the heat number for filler material. This DN was dispositioned without a justification for the actions taken. The action taken was changing the heat number on a rod slip because it was stated to be a clerical error.

W-742 Loss of power to ovens for an unknown length of time. The disposition was to bring the ovens back to the hold temperature for eight hours prior to issuance of weld rod. This was a generic problem and a Code violation because the rod or wire was not rebaked as required (see Allegation A-215).

W-5917 The DN was issued on a heat number problem for filler material. (See concerns for W-3656 and W-5755 for disposition.) Also, there was no indications that the weld record was corrected or that the QC inspector's failure to note the filler heat number problem, if in fact it was incorrect.

W-381 Identified the problem that welds were being painted prior to the final visual inspection. The recommended disposition was to comply with EBASCO letter F-33795-E. There was no indications that the reinspection was performed utilizing the initial inspection criteria. An inspection through paint was unacceptable under ASME and AWS Code requirements. Closure appeared to be invalid.

The following additional DNs should have been upgraded to NCRs:

W-1876, W-5824, W-4112, W-5047, W-5692, W-5416, W-6243, W-5916, W-381, W-6349, W-2105, and W-728.

Note: There appeared to be a generic problem with heat numbers being entered incorrectly or clerical errors being made on rod slips. Examples are W-5824, W-3656, W-4648, W-4968 and W-4969. A DN, NCR, or CAR was not issued to prevent recurrence.

Request For Information (RFI) or Information Requests (IRs)

The NRC staff also reviewed the various forms of Request for Information and how those requests were resolved; that is, via a clarification, a Nonconformance Report (NCR), a design change, a Field Change Request (FCR), or a Design Change Notice (DCN). The staff conducted the following review by contractor:

NISCO

The NRC staff reviewed the actions taken by EBASCO engineering to resolve 38 selected RFIs. This review was to determine if the response to the RFI was a clarification, an NCR, or an FCR. The NRC staff also reviewed the supporting documentation for work, repair, use-as-is, or the design change. The RFI

document was utilized as a tool to correct problems, but it was not issued as a method to resolve design problems. The RFI did make reference to the document used to resolve the problem. The staff review revealed that the actions taken were correct and that the quality records were complete and technically adequate.

Tompkins-Beckwith (T-B)

The NRC staff reviewed the actions taken by EBASCO Engineering to resolve Information Requests (IRs). A sample of 20 IRs were selected from the EBASCO Engineering files. The review revealed that EBASCO responded to the request by clarification (referring to appropriate drawing revision or specification/ procedural requirement), NCR, DN, FCR, or DCN. This provided direction to T-B on how to proceed. Design information was not provided on this document; rather to the referenced document containing the required information.

In conclusion, the NRC staff found that the QA program requirements for nonconformance identification, control, and proper corrective action was not complied with. The design change control system was incorrectly substituted to report "after-the-fact" nonconformances and T-B DNs were not properly upgraded to NCRs. Additionally, the QA program was, in effect, circumvented, and the required review for 10 CFR 50.55(e) reportability was not accomplished.

Actions Required: See Item No. 4 of the enclosure to the D. Eisenhut letter to J. M. Cain dated June 13, 1984.

Task No.: Allegation A-303a

Characterization: It is alleged that Tompkins-Beckwith (T-B) did not provide documentation necessary to verify that the welding backing rings and the weld base material were compatible.

Assessment of Allegation: In assessing this allegation, the NRC staff examined the relevant ASME Code and documentation for the purchase, storage, and installation of weld materials. ASME Code Section III states that weld backing rings can remain in place after welding, provided the ring and base material are compatible. ASME Code Interpretation III-1-77-208 further states that "documentation shall be adequate to identify the backing ring material as to specification and grade or may consist of a chemical analysis to establish compatibility." Backing material therefore need only be furnished with a Certificate of Compliance (C of C) specifying that the ring material was compatible for a particular base material or identifying the backing ring material.

The EBASCO piping isometric (ISO) drawing specified the backing ring compatibility requirements. This information was transmitted to the ring supplier on the EBASCO Purchase Order. Upon receipt, EBASCO verified the correctness of the C of C accompanying the rings.

When the rings were required, T-B issued a requisition on warehouse (ROW). The ring material requirements from the ISO drawing, as well as the related piping system identification, were shown on the ROW to assure the receipt of the correct rings.

The NRC staff also reviewed the documentation of the main steam, feedwater, and component cooling systems, which have backing rings left in place after welding. In the main steam and feedwater systems, backing rings were only used on joints of non-seismic Category I portions of the piping systems. In the component cooling system, they were used on a Class 3 carbon steel branch line. In all cases, the certification was found sufficient to verify the compatibility of the backing ring and the weld base material.

The staff discussed these findings with the alleger, who agreed and expressed satisfaction with the explanation.

This allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-304, A-305, A-285b

Characterization: The allegation is that changes to quality assurance (QA) documentation were made by a Tompkins-Beckwith (T-B) records reviewer who was not a QA inspector.

Assessment of Allegation: The implied safety significance of this allegation is that an unqualified person made changes to QA documentation which could affect the acceptability of safety-related piping systems.

The NRC staff reviewed T-B procedures for documentation review of piping systems and for certification of personnel reviewing piping documentation. The staff also reviewed the certification and resume of the records reviewer who made changes to the QA documentation.

The NRC staff found that the reviewer was correctly certified as a records review specialist in accordance with T-B procedure and the procedure met the requirements of ANSI N45.2.6, 1973. The staff noted that T-B procedures did not require changes to be made only by QA inspectors, and that records review personnel with the required indoctrination and training could make changes to QA documentation.

This allegation has neither safety significance nor generic implications and is not indicative of any management problems.

Actions Required: None.

Task: Allegation A-306c

Characterization: The allegation is that there was a lack of EBASCO documents for traceability of bolts one inch or less.

Assessment of Allegation: The implied significance of this allegation is that if the heat number traceability requirements of the ASME Code and 10 CFR 50, Appendix B, Criterion VIII were not met, the acceptability of safety-related systems could be indeterminate.

The requirements for the traceability of bolting material of one-inch diameter or less during receipt, storage, and installation are addressed in ASME Code Section III, NB-2150, NC-2150, and NA-3766.4, and Criterion VIII of 10 CFR 50, Appendix B. Heat code traceability requirements from the material supplier was documented by a Certificate of Compliance (C of C) or a Certified Material Test Report (CMTR). The NRC staff reviewed samples of these C of Cs and CMTRs and found them acceptable. The type of certification required for heat number traceability documentation was dependent upon the requirements of the ASME Code, EBASCO specifications, and the EBASCO Purchase Order.

The NRC staff found that the Bill of Material and the issuance records documented the heat or code number for installation and denoted the correct material code. For installation traceability, the NRC staff reviewed a selected sample of records which revealed that the correct bolting material type (i.e., SA-307, SA-193, SA-194) was actually installed. The NRC staff found the EBASCO and contractors' system for procurement, acceptance and installation of bolting materials and the method of control for traceability and identification, to be acceptable.

The NRC staff has concluded that this allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-306e

Characterization: A specific letter (File Reference W3-QAIRG-0420) enclosing Nonconformance (NCR) W3-5077 and the associated disposition was provided to the NRC staff for review to determine the adequacy of disposition.

Assessment of Allegation: NCR W3-5077 was written to address deficiencies found during the review of documentation by American Bridge. The deficiencies were listed into four categories: (1) welding qualification, procedures, and associated NDE reports; (2) temperature control of weld filler material; (3) questionable torquing of bolts and the associated remarks on the reports; and (4) the general method of documentation.

Based on the sample review of American Bridge work and supporting documentation, a complete review was conducted on American Bridge. As noted on the NCR, the individual NCRs written from that 100% review were to be included in the final disposition of the NCR. A total of 26 NCRs are associated with the disposition of NCR W3-5077. In addition, as a result of these NCRs, there was a significant construction deficiency (SCD-78) designated for the nonconformances associated with American Bridge. This was reported to the NRC staff under the requirements of 10 CFR 50.55(e).

The NRC staff has been aware of these issues and is addressing them in the resolution of SCD 78. Therefore, this specific letter has no safety significance. Generic implications are being addressed by the NRC staff in SCD 78.

Action Required: None.

Task: Allegation A-306t

Characterization: The allegation is that noncertified document reviewers were making changes to QA documentation.

Assessment of Allegation: The implied significance of this allegation is that changes to QA records of safety-related systems made by unqualified persons could affect the acceptability of those systems.

Allegation A-306t concerns the qualification of a specific document reviewer and changes to a nonconformance report (NCR). This issue was addressed by reviewing qualifications of the subject reviewer, as well as the procedure requirements for records review and quality record reviewer qualifications. The NRC staff found that the person specified was correctly certified as a QA Document Controller. Review of Tompkins-Beckwith (T-B) procedures allowed changes or corrections to be made to records by records review personnel.

There are no specific training, qualification or certification requirements for record reviewers in NRC regulations, the ASME Code, or the ANSI standards. The T-B record review system is considered to be adequate.

In conclusion, the person cited in Allegation A-306t was qualified to perform record reviews and the T-B record review system is considered adequate. This allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegations A-306u and A-306z

Characterization: The allegation is that Tompkins-Beckwith (T-B) did not adequately control measuring and test equipment (M&TE) and that this could cause test and measurements to be invalid.

Assessment of Allegation: The implied significance of this allegation is that inadequate control of M&TE used in activities affecting quality could invalidate the results of test and inspections and render the quality of installations as indeterminate.

The NRC staff addressed this allegation by reviewing the T-B procedures and quality manual section associated with M&TE calibration and control. The procedures establish a sound M&TE control system.

A review of work packages that contained hydrostatic testing records was conducted to verify M&TE calibration and control. Two gauges were used during the hydro tests and both were calibrated prior to and after each test. The hydro test results were not accepted until the post-test calibration was complete and acceptable. The acceptance criteria specified that one gauge must exhibit proper post-test calibration. This system was also observed in the Mercury Company packages.

All of the calibration records reviewed had a quality control signature for observation of the calibration and review of the data by quality engineers. The instruments used for the test were documented in the hydro test data. The pre- and post-test calibration sheets were also included in the hydro test data.

The NRC staff generically looked at NCR/DN dispositions for calibration as a part of its assessment of Allegation A-33. Based on the review conducted, the NCR staff believes this allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegations A-308; A-306j, A-306r

Characterization: The allegation is that the piping system documentation of various contractors and LP&L is inadequate and that it cannot be verified that piping systems were installed and inspected in accordance with the ASME Code.

Assessment of Allegation: The implied significance of this allegation is that inadequate documentation reviewed and accepted by Tompkins-Beckwith (T-B), Mercury, EBASCO, and LP&L could render the acceptability of installation and inspection of various piping systems as indeterminate.

The NRC staff reviewed documentation procedures of various sub-contractors, EBASCO, and LP&L to verify that they were in accordance with the ASME Code, 10 CFR 50, and the applicable ANSI N45.2 requirements. The Staff verified implementation of the procedures by reviewing Mercury and T-B turnover packages for technical adequacy and content.

The T-B packages included both large and small bore piping for safety-related systems. The selected startup systems (SUS) sampled included Component Cooling Water, Reactor Coolant, and Safety Injection. Packages withdrawn from the vault were sealed and each package had been reviewed by both T-B and EBASCO's Quality Assurance Installation Records Group (QAIRG). Each review was documented on a checklist noting accept/reject status with the reviewer's signature, initials, and date. LP&L had sampled 10 percent of the turnover packages, and their review was also documented with accept/reject status.

Included in the T-B documentation packages were the following quality documents/ records: Construction Installation Records Review Check Lists signed/dated by QAIRG (1 each for T-B and EBASCO); Traveler Index's; Bill of Material; Weld Control Record(s); Travel Erection Sheet(s); Weld Repair and NCR Index's; Cleanliness Reports (as applicable); Code Data Reports, CMTRs and C of C's; NCRs; Flange Control Documents; NDE Reports; Piping Modification Travelers; Discrepancy Notices; CIWAs; and ISO-Drawings.

The NRC staff observed that T-B and EBASCO maintained adequate, detailed quality records. The accept/reject status was noted by appropriate inspector/ reviewers by signature and date.

The NRC staff found that records had been reviewed for accuracy and completeness prior to being filed as historical records, that inspection/test results were documented and traceable to the material, and that records were readily retrievable.

The NRC staff found that the T-B and EBASCO documentation system was adequate. This portion of the allegation had no safety significance and was not indicative of any adverse generic implications.

The Mercury packages reviewed were for the Reactor Coolant instrument lines. The packages were stored in the Mercury and EBASCO vaults and retrieved by LP&L for review purposes. Each package reviewed had been previously reviewed by Mercury QA and EBASCO QAIRG. The Mercury review was denoted on each

document, and overall package acceptance was delineated on the Mercury Documents Requirements Form. EBASCO QAIRG review was documented on the Construction Installation Records Review and Status Check List.

Included in the Mercury packages were the following documents:

(1) EBASCO Review Check List (dated and signed by Ebasco QAIRG reviewer);

(2) Mercury Documentation Requirements Form/RPT-Form 209 (Documentation Index);

(3) Operations Control Report (OCR) cover sheet;

(4) Process Control Traveler;

(5) Pipe and Tube Inspection Report;

(6) Material Verification-Heat Nos. Traceable, CMTRs, and C of C;

(7) Weld Data Sheets;

(8) NDE Reports;

(9) Quality Control Reports-acceptance of work;

(10) NCRs;

(11) CIWAs;

(12) As-built/Red-Lined drawings - (latest revisions); and

(13) Hydrostatic/Pneumatic Test (as applicable), including

    (a) Hydrostatic/Pneumatic Test Instructions,

    (b) Hydrostatic/Pneumatic Data Sheets,

    (c) Valve Line-up Sheets,

    (d) Hydro/Pneumatic Test Discrepancy List,

    (e) Weld Data Sheets (info copy to verify weld no.; not used for B31.1 tests),

    (f) Calibration Sheets, and

    (g) Piping and Instrumentation Drawing (P&ID).

The NRC staff reviewed Mercury's quality records and verified the following:

1. Documentation of Mercury QA and EBASCO QAIRG review.

2. Documentation of Authorized Nuclear Inspector (ANI) review and acceptance of documentation package.

3. That EBASCO QAIRG reviewed 100 percent of the packages and LP&L reviewed packages on a 10 percent sampling basis (similar to Mil-Std 105D sampling techniques).

4. That inspection/test results were documented and traceable to installed hardware.

5. That inspection weld records, drawings, and other quality records generically appeared to be complete. However, they were awkward and cumbersome, and it was difficult to follow the traceability of individual records.

6. That record retrievability was not timely.

7. That weld records were not always original documentation (see Allegations A-197 to A-206).

8. That system walkdown disclosed that the installation (as-built) matches final drawings. Two N-5 installation Code Data Reports were found to be in nonconformance with the drawings.

The NRC staff concludes that this allegation has neither safety significance nor adverse generic implications. See Allegations A-183, 184, 197 to 206, 223, and 230 for additional information.

Actions Required: None.

Task: Allegation A-319

Characterization: It is alleged that EBASCO closed NCRs on instrumentation support weld deficiencies prior to protective coating application.

Assessment of Allegation: Instrumentation supports were fabricated, installed, and repaired by Mercury; while protective coatings were applied by Sline Industrial Painters, Inc. NRC confirmed that EBASCO QA closed the NCRs after the welds were repaired and prior to protective coating application.

Protective coatings were applied to components to inhibit corrosion and to enhance cleaning and decontamination. However, there was no requirement for immediately applying coatings to a repair area. Protective coating inspection and repair was picked up in the final area walkdown in accordance with procedure ASP-IV-141. Touch-up paint was handled on an area basis and not item-by-item.

The NRC staff inspected instrumentation supports and local stands in the reactor auxiliary building (EL-35.00)and reactor containment building (EL-4.00 and +21.00) and found that the area walkdown was effective. There were no unpainted welds detected. All repaired welds had been coated. Accordingly, this allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-332, A-333, and A-334

Characterization: The allegation is that (1) DCN-MP-920 is inadequate, (2) welder certification is questionable for welding on piping between the spent fuel pool and the low pressure safety injection pump and the suction line from the condensate storage tank to the emergency feedwater pump, and (3) N stamp and Code classification on lines as signed by inspector B07783215 are questionable.

Assessment of Allegation: The implied significance of this allegation is that improper design change, unqualified welders, and lack of or improper Code classification of installations could cause the quality of construction to be questionable.

The NRC staff reviewed the three allegations as follows:

A-332 The NRC staff reviewed DCN-MP-920, dated September 12, 1983, for technical content and adequacy. The intent of the DCN was to designate system code classification boundaries on piping from tanks, pools, canals, and connecting nozzles. The system boundaries were clearly defined and the DCN was considered appropriate for the intent.

A-333 The staff reviewed welder certification records for personnel performing welds on the low pressure safety injection pump suction piping from the fuel storage pool, and the suction line to the emergency feedwater pump from the condensate storage tank. Field weld records were compared with welder certification records and no violations were noted.

A-334 The staff found Code classification of the lines for the tanks, pools, and spent fuel transfer piping were correctly designated on DCN-MP-920 and were fabricated to the requirements of ASME Code Section VIII using the material requirements of ASME Section III. The subject piping was classified as required to be non-safety or safety-related with the applicable seismic category or 10 CFR 50, Appendix B requirements assigned. This type of classification, using the various codes for one system, was common practice in the nuclear industry.

In conclusion, the NRC staff found the design change, the welder qualifications, and the code classifications to be acceptable. These allegations have neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-335

Characterization: It is alleged that documentation does not exist to verify that inspectors who signed concrete curing records for the reactor containment building (RCB) dome and parapet wall were on site over weekends in order to implement procedures requiring that concrete being cured be monitored once a day for seven consecutive days.

Assessment of Allegation: The basis for this allegation was identified by EBASCO during their review of Fegles Power Service Corporation documentation. EBASCO brought these discrepancies to Fegles attention in a March 11, 1980 letter (W3QA-9766) from the EBASCO QA Site Supervisor. A nonconformance report (NCR W3-2169) was generated by Fegles Power Service Corporation to address the record discrepancy, the lack of a seven-day curing time, and the lack of inspection checks for curing at the end of the first day. The NCR recommended "use-as-is" for disposition of the issue based on the compressive strengths of field-cured cylinders and the core drilled cylinders for some of the RCB dome placements. The NCR was closed by EBASCO on November 18, 1981.

The NRC staff reviewed this NCR and its disposition and determined that there are no outstanding safety questions as a result of these curing record discrepancies. This allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-336

Characterization: It is alleged that skewed angles were not taken into account by Tompkins-Beckwith (T-B) in the specification of weld size for pipe supports having members joined at various angles.

Assessment of Allegation: During the LP&L Quality Assurance (QA) system turnover audit of the low pressure safety injection system from April 26 to June 2, 1982, undersized pipe support welds were identified. The findings are documented in the LP&L Site Audit Report WS3-82-40, dated June 4, 1982. EBASCO Nonconformance Report (NCR) W3-4010, dated June 28, 1982, was subsequently issued to direct T-B to reinspect 4,552 pipe supports for the purpose of documenting each support's actual physical configuration.

EBASCO Site Support Engineering utilized this configuration data to evaluate the adequacy of the as-found condition of the welds in accordance with the requirements of American Welding Society (AWS) Structural Welding Code AWS D1.179, Appendix B, "Effective Throats of Fillet Welds in Skewed T-Joints." EBASCO also issued Revision No. 7 to Field Change Request (FCR) No. MP-1153 which contained a welding guideline table that was a tabulation of required weld sizes for various dihedral angles developed from the equivalent fillet weld leg size factors contained in the AWS standard. The installation of supports subsequent to the issuance of the FCR was performed in accordance with the provisions of the welding guideline table.

The NRC staff verified compliance with AWS requirements for skewed-weld designs by randomly inspecting documentation and as-built conditions in a number of supports. A support in the component cooling water system was also selected specifically for verifying its design details. NRC's review of the calculation package indicated compliance with the AWS standard.

NRC reviewed the EBASCO procedure used to review the records generated by T-B prior to turnover to LP&L. This document, QAIRG3 No. 11-H, contains a Hanger Technical Review Checklist which states, as attribute No. 14, that, "Skew T-weld joint criteria must be verified to FCR-MP-1553." Based on the items reviewed, the NRC staff has concluded that skewed angle welds have been properly taken into account, either in response to the NCR or in the implementation of the FCR. NRC discussed its findings with the alleger, and he agreed and expressed satisfaction with the resolution.

The NRC staff concluded that this allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-337

Characterization: The twofold allegation is that (1) Mercury instrumentation and control tube track welding should have been performed to the requirements of AWS welding specification D1.3 for sheet metal rather than to AWS welding specification D1.1 for structural steel, and (2) because Mercury Procedure 658 was revised on March 15, 1983, to include AWS D1.1 welding requirements, any tube track welding performed prior to this time may be inferior and should be reviewed and upgraded if necessary to the revised procedure.

Assessment of Allegation: For the first part of this allegation, AWS Specification D1.3 covers the welding of thin plate, such as sheet metal. The alleger felt that since the tube track material was thin (0.110 inches), AWS Specification D1.3 should be used rather than AWS Specification D1.1.

The tube track weld was qualified per ASME Section IX for thicknesses of between 1/16" (0.0625 inches) and 7/8" (0.875 inches). Since the requirements of ASME Section IX are equivalent to or give broader coverage than those of AWS D1.1 and D1.3, any weld within the applicable thickness range can be successfully performed to conform with either code. Accordingly, there is no need to use Specification D1.3 for welding thin metal.

For the second part of the allegation, EBASCO General Specification 1C-1 states that "welding of safety-related structures, systems and components shall be performed in accordance with the requirements of ASME Section IX." The exception is structural steel, which can be welded to AWS D1.1 specifications (see EBASCO specification LOU 1564.724). Welding standards required by ASME Section IX are equivalent to or give broader coverage than those of AWS D1.1. Mercury welders and procedures were qualified to Section IX. Mercury considered tube track welding to be structural welding and designed their related program accordingly.

During an LP&L audit, it was discovered that the required welding inspection was not properly performed. In order to correct the inspection problems, Mercury Procedure 658 was revised to formalize the use of D1.1 welding and its associated inspection requirements.

EBASCO then reviewed the as-weld condition of the tube track welds. They tested the worst-case design loading conditions, choosing samples representing the worst welds obtainable, and found that the strength of the welds was at least comparable to the strength of the base metal. The test results indicated that the welds performed prior to March 15, 1983 were acceptable for the service intended and that no reinspection or upgrading was necessary.

The NRC staff discussed these findings with the alleger who expressed general satisfaction with the explanation. For further assurance, the staff visually examined some welds during subsequent plant walkdown and found that the welds were acceptable.

The staff concludes that this allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-340

Characterization: It is alleged that cable trays were not cleaned prior to installation of cable tray covers.

Assessment of Allegation: The implied significance of this allegation is that debris left in cable trays could cause or propagate a fire.

Cable tray covers were being installed by EBASCO in accordance with Administrative Site Procedure ASP-IV-48, Revision N, "Permanent Plant Equipment Removal and Reinstallation Procedure".

In assessing this allegation, the NRC staff examined Equipment Service Form 84-3-21, Sheets 3 and 4 of 39, which was an example of the detailed procedural requirements for the installation, inspection, and documentation of cable tray cover installation activities. Item 5 on sheet 3 of 39 states "Verify cleanliness immediately prior to cover installation." A review of the installation and inspection documentation (sheets 5 thru 39 of 39) revealed the following:

- 2 installations were inspected for cleanliness the same day as covers were installed.
- 6 installations were inspected for cleanliness 6 days before covers were installed.
- 8 installations were inspected for cleanliness up to two weeks before covers were installed.
- 7 installations were inspected for cleanliness up to three weeks before covers were installed.
- 10 installations were inspected for cleanliness over one month before covers were installed.

Based on this review, the NRC staff concluded that the requirement for QC verification of tray cleanliness "immediately prior to cover installation" was not, in many cases, complied with.

Because of this discrepancy in procedural conformance, the staff requested that LP&L remove installed tray covers in various plant areas to determine if the trays were, in fact, clean. Covers were removed by LP&L and inspected by NRC in the following areas:

- Reactor Auxiliary Building, Elevation +21, Switchgear Room A (3 Sections);
- Reactor Auxiliary Building, Elevation +21, Switchgear Room B (3 Sections);
- Reactor Containment Building, Elevation +21 (1 Section below floor grating);
- Reactor Containment Building, Elevation +35 (1 Section below floor grating).

No debris was found in any of the trays inspected.

In summary, although many tray sections were inspected for cleanliness well in advance of actual cover installation, the basic requirement that trays be "clean" at the time of cover installation, was acceptable. This allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegation A-341

Characterization: The allegation is that deformed cable trays were "cinched up with a come-a-long" in order to install the cable tray covers.

Assessment of Allegation: The implied significance of this allegation is that the method of using a mechanical device to compress cable trays to install the covers may have caused damage to cables installed in the trays.

Since the alleger did not give specific locations where such instances occurred, the NRC staff inspected 1800 feet of cable tray as follows:

- Reactor Auxiliary Building: +21, -4, and -35, elevations.
- Reactor Containment Building: +21, +35, and +46 elevations.

The NRC staff's inspection revealed no instances of damaged or deformed cable trays that would have indicated damaged cables.

This allegation has neither safety significance nor generic implications.

Actions Required: None.

Task: Allegations A-347, A-072, A-076, and A-077

Characterization: It is alleged that EBASCO's Nonconformance Report (NCR) W3-6514 was incorrectly resolved and closed, and that uncertified steel was used for instrument tubing supports.

Assessment of Allegation: EBASCO letter F-61147E (February 10, 1983) summarized the results of a study made by EBASCO of certain Mercury instrumentation tubing supports, identified a number of discrepancies, and documented suggested solutions. Item 7 in the letter stated that the wrong heat number was stamped on a support angle, and NCR W3-6514 was prepared to cover the resolution of this material traceability discrepancy.

In addition, an alleger stated during a discussion with the NRC staff, that uncertified steel may have been used to fabricate instrument tubing supports. Instrument tubing supports were furnished to EBASCO by Bergen-Patterson. Additional structural items to be used as makeup pieces during tubing support installation were furnished by EBASCO and requisitioned by Mercury as required.

In accordance with EBASCO Specification LOU 1564.723, all structural steel was required to meet ASTM specification A36. The material supplier needed only to supply a Certificate of Compliance (C of C) verifying this requirement upon delivery of material. At the request of EBASCO, the material supplier also furnished a material heat number.

Mercury Material and Equipment Control Procedure PCP-2030 stated that all material obtained from EBASCO was to be maintained in a segregated area.

Prior to release, the heat number was stamped on each item. Mercury required that when subsequent fabrication divided material into smaller-than-original lengths, the heat number was to be transferred to all resulting pieces. Mercury Procedure SP-652, used during fabrication and installation of hangers and supports, emphasized the requirement that material traceability was to be maintained. The traceability program that Mercury chose to use exceeded the requirement of the EBASCO specification, that permanent structural steel needed only to be certified as meeting ASTM specifications and grade. Mercury, however, added the requirement that traceability be further maintained through the transfer and recording of heat numbers.

During installation, a breakdown occurred in the above system and traceability was lost on some hanger material. Corrective action consisted of changing the Mercury traceability requirements back to the original EBASCO requirements for those hangers with missing information. A list identifying the location of each affected hanger was prepared. Supporting documentation was also included in the related Operational Control Report (OCR).

The NRC staff believes that the corrective action chosen did not compromise piping support integrity because Mercury had originally exceeded the EBASCO specifications, which were adequate. If all structural steel used on the project received the proper C of C, then traceability requirements were met, and further maintenance of identification was not necessary. To verify traceability, EBASCO reviewed all heat numbers furnished by suppliers of the structural steel used and found that no uncertified steel had been used to fabricate supports. The resolution, while outside the Mercury program, was an acceptable alternate.

The NRC staff determined that NCR W3-6514 was properly closed and that the structural steel used on instrument piping supports was properly certified. Accordingly, this issue has neither safety significance nor generic implications.

Actions Required: None.